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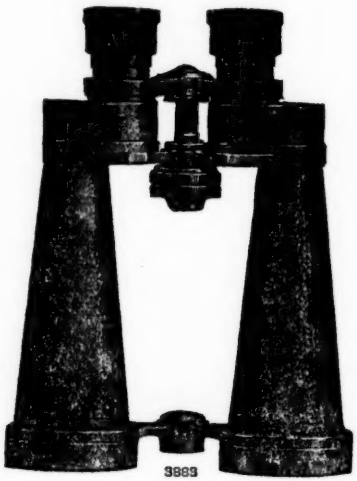

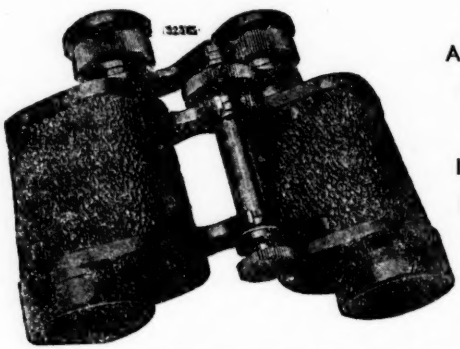

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UNIVERSITIES QUARTERLY

NOTES

"The Crisis in the University"

"The Crisis in the University" by Sir Walter Moberly is the first British book since Newman's to deal with the philosophy of university education.

This book is the result of a long series of discussions by a group of Christian university dons and others. They published through the Student Christian Movement twelve pamphlets on university problems some eighteen months ago. Since then they have been continuing discussions and Sir Walter Moberly has rendered an important service by taking an active part in these discussions, studying the results and incorporating them in this book for which, of course, he alone is responsible.

There has been much thought about the position of the universities in the United States in recent years. The Harvard report "General Education in a Free Society" has had the widest publicity; but other universities have produced similar reports, and there have been many developments, especially in the direction of how to combine a general education with necessary specialisation. Columbia University has probably led the way in practical work in these matters.

This country is much behind the Americans in the study of these vital problems. It is to be hoped that Sir Walter's book will lead to fresh and vigorous thinking on the fundamentals of university education. We regard the matter as so important that we propose to devote our November issue to a series of articles by leading authorities both in this country and abroad, each of whom will we hope, deal with the mission of the university and with many of the problems raised in Sir Walter's book from the angle of his own experience.

We take this opportunity of announcing that our August issue will be devoted mainly to a symposium on Medical Education in British Universities. There will be an important article by Farrer Brown, Secretary of the Goodenough Committee, outlining the recommendations of the Goodenough Committee, and describing how far they have been implemented. Other articles will deal with

the different aspects of medical education in the universities and will raise some important and controversial questions.

It is hoped that the February issue in 1950 will deal with the development (or lack of development) of the study and teaching of psychology in the universities.

University Expansion

It seems to be generally agreed that an increase in the number of students in the universities is desirable. The growing number of candidates who take and pass the Higher School Certificate examination and the reports on the distribution of intelligence and ability in the group of young men and women of university age are taken as evidence of the numbers that could profit from university education. These figures may, however, be deceptive as guides. They do not indicate the differences either in types of abilities or of interests, whether intellectual or professional. Further, no enquiry seems yet to have been made into the records of students at entrance and on leaving the universities, and the relationship between standing in the examinations at the beginning and the end of the university course. Nor has any objective evidence been produced for the statements not infrequently made, that as a result of preparation for open scholarships students suffer so greatly from the strain of competition that they do not fulfill the promise of their success. To this may be added the failure to take into account in any estimates of student numbers those who enter into a period of apprenticeship or articles which combines study and professional preparation for an examination.

The capacity of the national economy to provide employment for an increasing number of university students at salaries commensurate with their longer preparation has not been investigated. New careers are frequently mentioned, it is true, but the issue is whether employers are ready to appoint people on the strength of their degrees or whether the prospects of students would be improved by some form of preliminary vocational or professional education in addition to general cultural education. Fundamentally the question is whether universities can any longer disregard the motives that bring a considerable percentage of the students to them. To assume, as is so frequently assumed, that the main purpose of a university is to preserve its traditional character, while ignoring the needs of both society and students, is a position that requires justification.

It may be, if the universities continue to limit their task to preserving their character, transmitting general culture, and advancing knowledge through research, that new types of institutions will have to be created to which a large percentage of students should be directed. Should this happen, however, it would not be long before the products of these institutions would be scorned as " mere technicians," and the new institutions be driven to provide general cultural education as well as the technical or vocational preparation. The present situation demands that post-secondary education must be viewed as a whole in relation to the traditional purpose of the university, the new needs of society for different types of trained ability, and the needs of the students. If the expansion of the universities continues and the number of students increases at present rates, a great deal more realism must be brought to bear on the discussion of the many problems that must inevitably emerge, apart from the problems of finance, buildings and equipment, and staff.

The number of students in the United States and the ratio of students to population are often cited as an encouragement to the expansion of universities in Great Britain. In the United States, however, the relation between post-secondary education and the availability of jobs at appropriate salaries is apparently beginning to present a problem. Leaving aside for the moment the question of the comparability of British universities and American colleges and universities, and the greater variety of general and vocational courses offered by the latter, this problem at any rate is common not only to both these countries but to all.

In the *New York Times Magazine*, January 2nd, 1949, Dr. Seymour E. Harris, professor of economics at Harvard University, has a significant article with the startling title " Millions of B.A.'s But No Jobs " and a sub-title " That is the prospect before the country, and it has disturbing implications." Professor Harris discusses the danger of unemployment of graduates with its consequent " Frustration " and " Anti-Intellectualism." He urges the need of a thorough study of the supply and demand of college-trained men and women and continues :

" One of the other needs is for improved publicity on the part of colleges and Government. What are the objects of a college education ? What can a college graduate expect in the labour market ? And just what does he expect ? Perhaps many high school graduates are rushing off to college who should have stayed at home or joined the labour market.

Then again our traditional attitudes toward higher learning may need to be re-examined. We profess to believe in higher learning for its own sake. Yet we expect a college degree to pay dividends, to open up greater economic opportunities. Perhaps we overstress the vocational gains."

If this statement is considered as too brutally realistic, it may be suggested that an inquiry into the supply of secondary school teachers in arts subjects and particularly in the sciences may indicate its validity and encourage a far wider consideration of the problems involved in the movement to increase the numbers of university students. The Nuffield College report on "The Problem Facing British Universities" (par. 176) lists new demands on the universities but in general terms only. Further and more detailed investigations of these demands are needed.

Post-Graduate Studies

It will be generally admitted that one of the major functions of a university is to advance scholarship and to promote research. How time can be found for these important activities on the part of members of the staff is a serious problem which is discussed in the report of the University Grants Committee on "University Development from 1935 to 1946" (p. 59) and need not here be considered further. The emphasis placed upon research and publication when promotions are considered does however, indicate a certain depreciation of another function of a university—competent teaching.

The relative importance of teaching and research becomes a matter of serious concern when the education of the students is under consideration. While it is axiomatic that good teaching at the university level cannot be provided by a teacher who is not himself a scholar and engaged in research, it is equally true that to emphasise research as an end of education for the student is to miss another of the purposes of a university which is to develop the student into an intelligent human being. Undoubtedly from a good teacher the student should at the same time get some idea of the meaning, value, and methods of research, but that will not necessarily result in his becoming a research worker at the end of his undergraduate days.

During the three or four years of undergraduate work the student must or should continue his general education, acquire his specialised preparation, and find time for those activities outside the classroom which are believed to be as important for his education as the

formal courses and studies. This list raises the question where time can be found to achieve the aims mentioned. This becomes still more serious when it is remembered that there is a tendency to develop courses by accretion of content rather than by omission of any part of it that may be irrelevant or unimportant.

The relative importance of research and teaching so far as the students are concerned becomes a still more serious issue when their increase in numbers is taken into consideration. Although standards of entrance may in general be the same for all students, not all are equally fitted to advance to the stage where they can engage in research. Nor are many able to devote more than three or four years to university study. It may accordingly be more advisable to do the best that can be done for all students as undergraduates and to look out for those most competent and most promising candidates for post-graduate studies and training in research. For these there should be available a larger number of studentships than at present.

It is important in considering the organisation of post-graduate studies to bear in mind the eminently pertinent discussion of the subject in the recent report of the University Grants Committee (pages 42 to 44 and 58 to 60). In the movement to provide more opportunities for research there is the danger of forgetting that there is no one method of research. Failure to realise this has too often led to efforts to apply the methods developed in research in science to research in the humanities and social sciences. Against this injection of what has been called " scientism " the following statement in the University Grants Committee's report may be cited: " The search for hitherto unploughed fields of fact finding is not necessarily a profitable one, and some of the works of the most eminent teachers of our own age are brilliant illustration of the truth that the most significant contributions to human wisdom may consist less in the excavation of new facts than in the synthesis and illumination of knowledge already won." This point of view is important not only as a concept of what research should be, but also as a definition of the kind of preparation that would be ideal for the increasing number of teachers that are and will continue to be needed in the universities.

University Awards

The Report of the Working Party on University Awards (London: H.M.S.O., 1948) recommends the provision of awards from public

funds for 11,000 out of 16,000 eligible entrants to universities annually. These will evidently be in most cases what have hitherto been called bursaries or grants rather than scholarships awarded to students of exceptional academic promise. The 2,000 State Scholarships proposed will indeed be scholarships, since they are to go to the candidates who do so well in the scholarship examinations that they seem likely to get "firsts or good seconds." The 7,000 local scholarships, however, are for students whose performance in examinations does not suggest high academic ability, though they may possess talents of a high order. How these unspecified talents are to be discovered the report wisely does not attempt to define. The working party verbally accepts the principle that the universities have the right to select their own students. It is the more surprising, therefore, that the report goes out of its way to suggest the form of the examinations by which scholars would be selected, and even to suggest that in certain instances selection should be made by a Ministry of Education Final Selection Board. The report is of doubtful consistency, too, when it joins in the cry against undue specialisation, and then goes on to recommend that candidates for State Scholarships should show satisfactory evidence of general education and take not more than two scholarship examination subjects. As no candidate will fail to furnish himself with evidence of general education, and the examination results in one or two subjects are likely to be the discriminating factor, it will be surprising if these proposals reduce specialisation. The generous if somewhat sentimental enthusiasm of the egalitarian, combined with inadequate experience of university problems and methods, may lead to unexpected and probably unwanted results.

Uniform Minimum Entrance Requirements

The universities have now decided upon their matriculation requirements in terms of the General Certificate of Education which will come into being in 1951. The requirements recommended almost unanimously by the conference called last November by the Committee of Vice-Chancellors and Principals have as we go to press been adopted by the Universities of London and Durham and by the Joint Matriculation Board of the five Northern universities, and it seems likely that other universities will adopt the same requirements. Oxford and Cambridge will use the same requirements with a demand for a classical language superimposed.

Thus the long-standing nuisance of varying entrance requirements has been to a considerable extent done away with. The heads of schools, and their pupils, will be greatly relieved. This large measure of inter-availability of entrance qualifications has not been achieved without considerable sacrifice of wishes if not of principles on the part of many university people, and the spirit of compromise which has led to this result will be widely appreciated.

Inter-availability could be to a large extent lost if the universities, while requiring the same number and standard of subjects, were to adopt different lists of subjects approved for purposes of these requirements. The gesture of the Joint Matriculation Board, in deciding to accept any subject approved by any of the other university examining bodies which has the same set of requirements, is therefore greatly to be welcomed, and it is to be hoped it will be reciprocated.

It has been suggested that the universities, before deciding upon their entrance requirements, should have consulted the schools. This suggestion shows a great ignorance of what has actually happened. The universities have been discussing their requirements with the schools at least since the Norwood Report was published in 1943. A conference between representatives of universities and schools was begun in Cambridge and carried on over a period of many months in London. There are also regular channels of communication between the schools and the universities: for example, there are representatives of the secondary school teachers' associations on the Joint Matriculation Board, and that Board has an annual conference with school representatives at which matters such as University entrance requirements are discussed. If the universities do not know what school teachers think, it is not for want of telling.

Neither the universities nor the schools will be completely satisfied with the new requirements. Many people on each side claim to want to reduce specialisation in school studies and blame the other side for causing it. Many on both sides doubt whether the new General Certificate of Education will be any improvement on the old School and Higher School Certificates, and whether the Minister of Education has improved matters with his age limit of sixteen. The new requirements are a compromise, a finely balanced equilibrium of the various pulls and pressures. The universities have adopted them for an experimental period of five years. This period should be used by universities and schools together to try to work out

an improved system of selection for admission to the universities. The report of the Working Party on University Awards suggests that both may have to protect themselves against a system of examination and selection imposed on them by a bureaucracy.

Advanced Adult Education

Has the time now come for the extra-mural departments of universities to devote more of their resources to meeting the needs of advanced students, particularly those who are already graduates and wish either to take refresher courses in their own subjects or extend their knowledge of others?

Under recent legislation local education authorities are required to do what some, such as London, have done for a considerable time —to provide further education, including adult education of various kinds. Although they will continue to draw on the experience and resources of the universities for much of this work the roles of the L.E.A.s and the universities in this field are bound to alter. Much of the work of university extra-mural departments has in the past been fairly elementary. With the rise in the general level of education, the standard of their work would have changed in any case. The new compulsion now laid on the L.E.A.s as providers of further education will alter this still further.

Are the universities adapting themselves to the new conditions? Are they prepared to meet demands, for example, from graduates in economics who would like to take a course in recent international finance, or from arts graduates who would like advanced courses in poetry, music, or philosophy? Refresher courses for teachers are now provided by Institutes of Education, but it is not only teachers who are prepared to keep themselves up to date. Social workers, architects and scientists want to keep themselves in touch with new developments in their own fields, and there must be many graduates without professional reasons for needing refresher courses, who would nevertheless welcome advanced courses in their own subjects.

Some universities and university colleges have started advanced extension work of this kind, Birmingham being perhaps the most enterprising. But others, for example, Bristol and Bangor are moving in the same direction. There are many difficulties. The graduate student demands a first-class lecturer, and university staffs are already overpressed. Such lectures must also be limited to towns which have a large enough graduate population to provide

an adequate demand. A city like Birmingham can produce an audience for twelve lectures on modern music or the economic history of the inter-war years; small cities might have more difficulty in doing so. Nevertheless the experience of Bristol University of giving a course of lectures in an advanced branch of science in Taunton to a regular audience of 50 shows what hidden demand for courses of this type exists.

Scientists for the Schools

The schools are desperately short of graduate teachers in science, particularly those qualified to take sixth form work. The reason generally given is that science graduates are attracted into industry by the higher rates of pay. Only partial confirmation for this view is provided by figures given by the Secretary of the Appointments Board at Birmingham University in a letter to *The Times Educational Supplement*, January 22nd.

Students graduating in January, 1948	Number graduating	Remaining for University Research	Teaching and other Training	Entering Industry	Military Service and Untraced
Physics ..	25	8	5	10	2
Chemistry ..	29	20	1	3	5
Engineering ..	74	6	2	55	11

The interesting thing about these figures is the high proportion of chemistry students staying on for research, many of them with D.S.I.R. grants, or seeking a Ph.D. as an additional qualification. Presumably those whom the universities do not absorb—and they can only be a small proportion—will seek to enter industry. Teaching comes a very poor third. The sample is too small to be reliable, but it would be valuable to know how these figures compare with those of other universities. On this basis the schools will get their teachers only when the other demands are satisfied.

Employment Difficulties

The Canadian Department of Labour has recently sent out a circular letter to employers which is an interesting illustration of the difference in attitudes towards graduate employment in this country and Canada. The circular is a request to all employers that they should inform the Department what their openings for graduates will be at the end of the current academic year in order that the employment service may help them. If employers are in the habit of

approaching universities direct they are at liberty to continue this practice, but are asked to fill in the form for information so that the general picture may be known.

Several items in the form are of interest and point to a readiness to employ or be employed on work which is considered to be beneath the dignity of a university man in this country. One extract from the letter to employers illustrates this:

> " The necessity of listing all possible openings in clerical and general labour work is also stressed as it must be realised that employment in relation to studies cannot be provided for all students."

While the standards of first degrees in Canada and this country may vary greatly—for example the Canadian form includes a section on graduates in Household Science, more generally a university course than in Great Britain—the Canadian Department of Labour reflects a realism about employment prospects which is not general in this country.

The British Ministry of Labour is indeed beginning to be anxious about the employment of women graduates in the next few years. Women graduates who possess no specific technical or professional qualification and wish to enter employment without any further training are classified in the Appointments Register as " unqualified." It will become increasingly difficult to find jobs for these young women, unless they are either prepared to swallow their pride and take more modest posts, or some means are found to finance them in their fourth year, when they are taking a professional training. Local authorities already have wide powers to give grants to cover further education and training of this kind, but most of them are still too preoccupied with the cost and administration of the ordinary university grants to go beyond them. The problem of the year after graduation appears to be more difficult for women than for men, since employers are readier to take on " unqualified " men as trainees than women, who may marry and leave before they have justified the investment in their training.

But whether some method or other is found for financing a professional training for those who require it, there remains a wide gulf between the attitude of British graduates and that of their opposite numbers in Canada and America. Is the readiness of the latter to start on the workshop floor a desirable objective in this country? Surely a great deal more thought should be given to the aims of university education—particularly that of arts students.

*GENERAL SCIENCE IN EDUCATION

By F. Sherwood Taylor

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General Science, as a subject of study in schools, has perhaps suffered some decline in popularity in the last year or two. It is felt by teachers of science to be a soft and inferior way of learning the kind of science which they themselves were taught. General Science is, in fact, taught by chemists, physicists, or biologists, not by "general scientists," for the good reason that the universities do not afford a training in general science. Thus the normal result of teaching general science is the imparting of the rudiments of chemistry, physics and biology, together with a somewhat inadequate treatment of, *e.g.* astronomy and geology, subjects of which the teachers are unlikely to have made any systematic study.

Purpose of the Study of General Science

Let us then ask ourselves the purpose of the study of General Science, and try to visualise the kind of man or woman which such a course, begun at school, and continued at the university might hope to produce. The product of such a course should be alive to and aware of the aspects of science that matter to him as an intelligence and a citizen; he should in fact be *a natural philosopher with a social awareness.*

This product of the study of general science should, if his work has been wisely and acutely directed, have acquired certain mental equipment enabling him to relate himself, his society, and the external world generally, in accordance with the solidly-based facts and conclusions of science. This equipment must include three principal systems of ideas.

First in importance is a true assessment of the validity of the methods that science employs. Whether he supposes so or not, science will not be his only guide in his activities internal or external. He, therefore, requires to define and delimit science, to understand the nature of its data and its reasoning, and to be able to assess the degree of reliability of its various conclusions. He must be able to distinguish the types of problem to which the scientific method

* This and the two successive articles represent different attempts to determine the place and nature of science as part of general education.

is eminently applicable, partly applicable, and not applicable at all. He must understand the meaning of such terms as law, hypothesis, theory. In fine, a successful education in general science should enable the student to use science as a tool and to detect the nonsense talked by those who uncritically worship or denounce its methods.

The second result of a successful education in general science will be the acquisition of the framework into which the scientist fits the whole of the phenomena of the natural world; a picture of the universe in space and time, informed by the great principles that hold throughout the field of science, enabling the student to see the world as the scientist sees it—not in as much detail, but in terms of the same structure and relations. This picture is not to be accepted uncritically, for the teacher of the subject will have failed if he does not indicate the provisional character of the whole of it, varying from the comparative stability of the sciences where data are plentiful, to the highly labile constructs which have been formed from our scanty data concerning such subjects as cosmology.

The third result will be a knowledge of the manner in which science has been and is being applied to the satisfaction of human needs, enabling the citizen who has had such an education as we are considering to know the value of scientific research, and the probability of solving by its aid the practical problems of humanity.

That is what we wish to impart and it is no minor subject or soft option. In practice it will have to be realised in a school and in a university course.

The Organisation of Courses

The school course at once presents more than one difficulty: Is it to be designed as something complete in itself or as an introduction to a university course? Is general science to be taught by someone trained therein or by a specialised scientist? In view of the wide variation in the conditions and aspirations of schools I think we can only indicate a few directions in which the present science courses should be modified. In the first place, there should be continual attention to the methods of science. Pupils should be taught what is meant by "laws," "hypotheses" and "theories": emphasis should be laid on the aspect of science as research rather than as doctrine. Secondly, some sciences, now omitted or scantily treated, such as geology and astronomy should be treated seriously, and not merely in a descriptive manner, time being found by the

omission of things that matter only to the pupil who intends to become a scientist. In fact the test by which the suitability of the matter to be included should be determined will be "Is this essential to the formation of a wise man's view of the world?"

At present, there are, I believe, in English universities few or no courses in general science. Such courses could take two forms; (1) a course leading to a degree in General Science, which would be principally of use to teachers, civil servants, and the minute proportion of students who require an education as distinguished from a training; or (2) a course to be taken by all students as a subsidiary subject. It would seem that the same lines could be followed in either case, though it is obvious that the former alternative would allow much more thorough treatment, nor is it certain that the latter would have much value, particularly in view of the difficulty of raising any enthusiasm in the student for a subject widely sundered from that of his choice.

A university course in general science should certainly not be a mere survey of the rudiments of a number of sciences. It should, I think, be divided into at least three parts. These should be

(1) *General principles of science.* Such a course should expose the philosophical foundations of science, characterise its data, discuss its logic, and arrive at conclusions concerning its limitations and scope. A historical treatment is usual in the teaching of philosophy and should almost certainly be applied here. These are not easy studies, and it is possible that, though they may be first in logical order, they should, in fact, be the final subject of the student's attention.

(2) *General principles of the individual sciences.* There are in each of the individual sciences, and sometimes running through several of them, highly important generalisations on which the development of that science depends and round which its facts are grouped. It will be the task of the teacher of general science to select these principles, and to form around them a brief course of study of that science. This method differs from the usual one which considers various classes of phenomena and seeks the principles of each; but, faced with the problem of teaching, say, biology in a term or two, the only possible method is to enquire for the principles of prime importance, relate them, and illustrate them. Here is the great task of general science, to reconsider the sciences

in the light of their principles and build up a totally new method of teaching them.

(3) The third part of the course would be the consideration of the relation of science to society. The difficulty again is to find the teacher. Scientists with a smattering of doctrinaire political economy are only too easy to discover, while the political or economic expert too rarely knows anything of science. In this field as in the others, general science courses will have to educate men qualified to teach them.

Such a course as I have indicated could be supplemented, with great advantage, by some laboratory experience, which should take the form of work designed to answer questions, so imparting some idea of the nature of research. At the present time, when laboratory space is so scarce, this would, however, be impossible.

It is probable that really well-educated men of science would be produced by such a course as this, and in a more leisured age it would be an admirable preliminary to a scientific career. Today, as I have said, it would be followed only by a minority. The administration to all undergraduates of a course, conceived on these lines, would certainly be valuable if it could be so well taught as to hold their attention. To compress it into too short a time would, I am sure, be fatal to its interest, and it would require, I estimate, one lecture or class per week through two—or better three—academic years. This is no light enterprise, but, if successful it would do a great work in enabling the coming generations to understand and control the world in which they will live.

SCIENCE FOR NON-SCIENTISTS

By Bernard Lovell

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The rescue of the scientist from barbarism is an exercise which has been pursued with great fervour by scholars in the arts for a considerable time. It is a curious feature of our educational disease that these reformers give little thought to the grave deficiencies in their own type of education as an introduction to the modern world. The shape of our lives is now largely determined by the applications of science, which have materialised from the fundamental discoveries of the last two or three hundred years. To be ignorant of science is therefore to be unequipped for life today —" . . . Equally at present and in the remotest future, must it be of incalculable importance for the regulation of their conduct, that men should understand the science of life, physical, mental and social . . .". But Spencer's plea has been unheeded and today most politicians, almost all divines and a multitude in our universities are in this state of cultural vacuity.

Even those who study science as a career are now subject to such an intense specialisation that the only part of science which receives emphasis is the professionalised aspect, leading the students' interest to the methods and tools of the contemporary scientist, rather than stressing his approach to the subject. The fundamental modes of scientific thought and the place of science in the history of civilisation are rarely emphasised. Universities must soon take firm action to stay this drift to absolute dichotomy and aridity by introducing science, as distinct from modern physics, chemistry or biology, to their student population. The possible content of such a general purpose science course is the concern of this article.

The Scientific Approach

The recurrent theme of Lucretius " . . . this darkness of the mind can be dispersed only by Nature's aspect and her law, which, teaching us, hath this exordium: *Nothing from nothing ever yet was born,*" might well be adopted as a text. Science is essentially a way of looking at things. It is the duty of all who concern themselves with student teaching to make perfectly clear what this way is, for it must provide the foundation stone of our general course. The significance of the method should be made clear by contrast with

other processes of acquiring knowledge such as the creative activity of artists, poets, sculptors, writers, which are distinguished by the possibility of reaching a supreme standard of excellence in any epoch. The legacy of each generation to its successor lies chiefly in matters of technique, but on each society falls the onus of working out its own æsthetic ideals. In violent contrast to this the *results* of science are cumulative from generation to generation—a fact of the utmost significance to the future of mankind. If a scientist is sure of the integrity of the methods which he is employing to discover the truth, then he is prepared to accept and use whatever results those methods produce. The same procedure applied outside the realm of scientific technique is the only method by which an educated man can reach an unemotional and rational conclusion about a set of facts presented to him. Without this facility no man can live intelligently in the modern world. A university fails in its first duty if it does not make this abundantly clear to its non-scientists, and also to its scientists who are just as prone to reach emotional and irrational conclusions in the socio-political world.

The opportunities for a stimulating course on this subject are legion. The Galilean episode could be followed by illustrations, from the physical and biological sciences, of the detailed application of the scientific method. These could also serve the double purpose of introducing the non-scientists to essential scientific information and of broadening the specialist scientist's interests into related avenues. As examples one thinks immediately of Newton and the law of gravitation with one master stroke bringing order and unity to the intuitive circles and epicycles of the heavenly bodies; of Darwin's challenge to the prevailing inspired belief in the immutability of species, or of Pavlov's work on conditioned reflexes, influencing so strongly traditional ideas of education.

Of course certain dangers exist in overstating this case to impressionable minds for " When you understand all about the sun and all about the atmosphere and all about the rotation of the earth, you may still miss the radiance of the sunset." This sentence of Whitehead's epitomises a danger second only to the lack of science in education.

Knowledge of fundamental and applied Science

How much attention should be given to the discoveries of science in such a course ? As far as fundamental science is concerned it will

be necessary to strike a delicate balance between the dangers of ignorance of science and the inclusion of matter which is only suitable for the science schools. A good deal can be interwoven into the part of the course dealing more specifically with the scientific approach. A foundation knowledge of the elements of biology and related sciences and of the general factors influencing health and disease—particularly the social aspect—must be regarded as a prerequisite of successful existence and must be included in any such course.

A short course of elementary cosmology might well serve the purpose of the physical sciences, providing a good opportunity to discuss the microscopic and macroscopic contents of the universe. Elementary statistical ideas must be introduced, with particular emphasis on the dangers of reaching conclusions from small samples.

Knowledge of applied science may be readily included in the general theme dealing with the place of science in world development. Why has science become such an intimate part of the daily life of man? How has it come to pass that if a few scientific applications —such as power, telephones and motor vehicles—were suddenly removed, the world would be reduced to immediate chaos? An attempt to answer such questions will provide the opportunity for treating science as an essential part of history. As a particular illustration, the industrial revolution could be included as an example of the development of the science of power and of the ruthless exploitation of the possibilities of applied science when human welfare is utterly neglected. This example of applied science, which produced such misery and poverty that Carlyle was led to describe England as "Full of wealth, of multifarious produce, supply for human want in every kind, yet dying of inanition," awaited the development and application of medical and nutritional science before its effects could even begin to be alleviated. The last three hundred years of our history are rich with such possibilities for dealing with applied science in a logical and historical context.

Science and Philosophy

Science has given rise to immediate problems of human survival, many of which belong to political and military avenues outside the scope of this course. The fundamental problem behind this facade cannot be neglected. The void between man's code of behaviour and the material powers which science and technology have placed

in his hands is a direct result of the sterility of philosophy in the face of the dynamic advance of science. The progress of scientific discovery has been cumulative, but in each age the philosophers wrestle afresh with the eternal values so that, as Schweitzer remarks " . . . in the sphere of ethics, we live in a town full of ruins, in which one generation builds for itself here and another there, what is absolutely necessary." This must be presented as the central problem of science and philosophy in contrast to the speculative metaphysics to which modern science has given rise in this century.

Results

What do we expect from such a course? Certainly not a group of " non-scientists " who now know a little of what their fellow students do in the science schools. Rather a group of scientists and non-scientists who have been made aware of the principles and development of scientific thought and its effect on world history, together with a reasonable knowledge of man and his place in the cosmos as given by contemporary science. Above all, a group of men who are less likely to be stampeded by a propagandist and sensational Press and who realise that the prime condition for the existence of a modern state is not the excellence of its greyhounds, but the rapid and successful application of new scientific discoveries to technology and human welfare.

UNIVERSITY COURSES IN SCIENCE FOR STUDENTS OF THE ARTS

By J. A. Ratcliffe

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I have been asked to write about the teaching of science to non-scientific students at the university, and to consider particularly the methods which might be employed in this kind of teaching. Before we can consider these methods, and what sort of subject should be taught, we must be clear what are our objectives. Why do we wish to teach science to arts students at all? What part of science, if any, has any relation to education in the broad sense?

Object of the University

I shall assume that the object of the university is to turn out well-educated men and women, at home in their environment, understanding it and the people around them, with active minds anxious to understand more, and prepared to take a lead amongst their fellows. The university graduate should be alive to the intellectual problems of the time, and should have some knowledge of the methods of thought used in their solution. The student of arts will probably have little difficulty in accepting this statement of the universities' aim, but many science students may consider it too idealised and may believe that scientific education is directed much more to the training of specialist technicians, capable of playing a leading part in a research laboratory or in technical industry. This narrower view of the universities' objective in scientific education has received support in many minds through the publication of the Barlow report on scientific man-power which appears to suggest that the task of the scientific faculties of the universities is the *training* (not *education*) of more and better technicians. We must realise at the start that to many people the objectives of education seem, at first sight, to be different in science and in the humanities. The utility value of a scientific education is obvious to all, but its educational value must be sought for; a course in arts is obviously educational, but has it any use? Before we can decide how to teach science to students of the Arts we must decide what part of it is worth teaching; what is worth while for the humanist is probably not what is best for the future scientific

specialist to whom the " usefulness " of the subject may be of greater importance.

Two Kinds of Topics

Most courses for scientists deal with two different kinds of topics. First, they have to teach facts and the phenomena of nature, the story of how nature works; second, they have to deal with theories and hypotheses, the ideas which men have about the underlying principles which control the working of nature. The proportion of time devoted to these two aspects of a science changes significantly as the course advances. In science courses at school facts are emphasised; at intermediate level theories become of comparable importance; while in the final year facts may almost be taken for granted and theories are elevated to become the main subjects of study. Most scientists start by being interested in phenomena and at the end of their university course are more interested in ideas and theories.

Most arts students are primarily interested in ideas and in people, and their interest in phenomena is slight, so that a science course designed for them will be of greater interest if it begins with ideas rather than facts. But a course of this kind is just the reverse of the standard science course which deals first with facts and then with ideas, and it is a fundamental problem for the teacher that the part of the science course which is considered to be most " advanced " for the specialist, is that part which is most likely to be of lasting interest and value to the non-specialist. If, however, it proves possible to design a course based primarily on theories and ideas it should be possible to give the subject a real educational value for the intellectual problems can then be stressed and the student can be given a background into which he can fit new pieces of factual knowledge as he acquires them. As an illustration of this point of view we may notice that the best and most-read " popular " books on physical subjects are those dealing with wave-mechanics, relativity, the evolution of the stars, and similar topics, and not those which give an account of everyday phenomena or of the working of complicated machines.

Place of Ideas and Facts

Although I suggest that the ideas of science, and not the facts, will prove to be the most interesting and educative to the non-scientific student, I do not, for one moment, suggest that facts are

of no importance to him. It does seem to me, however, that we must choose very carefully those facts which are suitable for inclusion in our general courses. I would include some of those phenomena encountered in everyday life and would select particularly those which would lead to further observation without the need for special equipment and those which would lead to interesting speculation and further enquiry. After attending a general course of science a student should feel an urge from time to time to observe new phenomena for himself and to interpret them in the light of general theories. As an example it would be interesting to show some lecture demonstrations of the diffraction of light and other waves and to discuss the theory underlying them. The examples might be based on equipment found only in laboratories, but the ideas would be extended to include also phenomena easily observed in everyday life, not only with light but also with radio, sound and water waves. Any inquiring student who had seen and heard about phenomena of this kind would find himself from time to time observing and interpreting similar phenomena; his interest in his surroundings would have been enhanced and one of the objectives of education achieved.

The example just given illustrates another principle of interest. In the study of any subject great aesthetic pleasure is often felt when it is first realised that some phenomena or ideas, previously thought to be unrelated, are but different aspects of some underlying general principle. If the topics chosen for the courses in science can sometimes be of a kind which brings out unexpected relations of this nature, more than usual interest will be aroused and the student may be encouraged to continue, on his own, a search for other similar relationships. It might even be argued that this unification of ideas, which explains most of one's experiences in terms of a few general principles, so that nothing comes as too great a surprise and so that experiences seem to be ruled by order rather than chaos, is essential in some degree to the development of a well-educated mind.

Scientific Method

Probably the most important general impression which must somehow be conveyed to the arts student through the special courses in science is the nature of " scientific method " and some idea of how the scientist's mind works. Much misunderstanding often

occurs between a technical expert who is a graduate in science and an administrative executive who is a graduate in arts simply because they are trained to approach problems differently. The scientist while at the university is interested in things and precise logical argument, and is anxious to question any statement based only on tradition or authority, he demands the right to test any statement for himself; whereas the arts student's chief interest is in people and in the organisations they have built up and the traditions on which these organisations rest. If the arts student could be shown at the university how the scientist thinks and why he thinks as he does, it would make for considerably greater ease in the organisation of a world which is daily becoming more technological.* The best way of showing the nature of the scientific method is to discuss some classical examples of its application to the discovery of new principles. This should open up the possibility of a historical approach to parts of the subject, including the introduction of biographical details of some great scientists, an approach which will be acceptable to many arts students.

A Course for Non-Scientists

The course which we are to plan is seen, therefore, to be one which deals primarily with theories and ideas, secondarily with phenomena. Those phenomena which are mentioned should be of a type which will lead to the search for other similar phenomena in everyday life. Broad general principles which relate apparently unrelated phenomena should be particularly included, and some subjects should be treated historically so as to bring out the principles of scientific method and to relate the subject to the lives of individual scientists. Somewhere in the course it would be useful to discuss the interplay between new discoveries and new techniques and to show that better techniques, born of new discoveries, have led in turn to still more new discoveries. In this connection the need for large machinery and large organised teams of workers in some specialised branches of physical research could be contrasted with the " string and sealing wax " era in which individual geniuses, like Rutherford, were able to deduce the most important ideas from the most primitive apparatus.

Courses planned on thise principles should range over as wide a field as possible. Each should contain some examples of an exact

* It is possibly even more important that the scientist should be shown how the student of the Humanities thinks, but this is not the place to pursue that topic.

science, probably physics, and of an inexact science, probably biological. The contrast should be drawn between the application of the scientific method to a problem where all the factors are controlled and understood and one where most of the important factors cannot be controlled. Ideas of statistics and probability could be introduced with advantage, either through physical or biological science. Most arts students will find this subject interesting and it is always both educational and useful.

Of the different scientific subjects physics presents the best opportunity for the discussion of interesting fundamental ideas, even if they are sometimes difficult to understand thoroughly. Biological subjects provide the opportunity to introduce everyday phenomena of a kind which will awaken most students' powers of observation. Chemistry does not appear to offer such great possibilities for a course of the type we have outlined, since apart from one or two very valuable topics (such as combustion and the part played by carbon dioxide in the life cycle) most of the theories and phenomena can only be properly appreciated by a worker in a laboratory, or by one who is interested in detailed methods of manufacture, into neither of which categories arts students normally fall.

Finally, who is to give the lectures in this kind of subject? The answer is that he must be an enthusiast; someone who believes in the educational value of science and yet who sees what a large portion of the science taught to scientists has no educational value at all. For preference he should have studied both an exact and an inexact science, so that he appreciates the two different viewpoints, and, on balance, I do not think he should be a chemist. If he has attended some arts lectures himself, and therefore appreciates the great difference in outlook between the two sides of our educational system, so much the better.

IMPRESSIONS OF BRITISH UNIVERSITY EDUCATION

By T. R. McConnell

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Under a subvention from the Carnegie Foundation for the Advancement of Teaching, I had the opportunity to visit, in some instances very briefly and in others for a week or more, over a total period of three and one-half months, twelve British universities and several secondary schools. During this time, I was able to talk to a large number of administrative officers, faculty members, and students, all of whom graciously and generously tried to aid their guest to realise his purpose of " seeing British education through British eyes "—a difficult goal indeed for an outsider to attain, for one can really understand a university only by living in it for a considerable period of time. As an introduction to current university problems, I had the good fortune to attend the Sixth Congress of the Universities of the Commonwealth at Oxford as an observer from the American Council on Education.

The spirit and the measures with which the British universities have met the difficulties and new responsibilities of the postwar period evoke only the greatest admiration. It is difficult to see how they have managed to care for the great increase in enrolment with practically no expansion of physical facilities, and yet one believes that they have done so without serious sacrifice of educational standards. One is impressed with the progress already made toward the goal of making it possible for the ablest students to reach the university regardless of social position or financial means, and with the future programme of student aid recommended by the Working Party on University Awards. One finds surprisingly rapid progress in the improvement and reorganisation of professional education, for example, in medicine and teacher training. The planned expansion of education in dentistry, veterinary medicine, agriculture, science, and technology will bring the universities much more powerfully to the aid of the country's future social and economic development.

The Social Sciences

Somewhat less adequate are the steps which have been taken for the expansion of the Social Sciences. In this field, except, perhaps,

for economics, the British universities as a group seem to have failed to keep pace with the development of research and scholarship. In the *Universities Quarterly* for February, 1949, Max Beloff commented on the fact that the subject of political science is much more prominent in American universities than in any British university except Oxford and the London School of Economics. In the same issue, Edward A. Shils noted that whereas sociology has attained full-fledged departmental status in the universities and colleges of the United States, only London and Liverpool in Great Britain have fully established departments in the subject. My impression is that, despite the encouragement of the University Grants Committee, the universities have been much too hesitant and academically cautious in their plans for the future development of political science, sociology, social anthropology, and social psychology.

Scarcity of properly qualified candidates for appointment makes rapid development in these fields difficult, it is true. It may be granted, also, that over-expansion in some of the social sciences has taken place now and then in the United States. But even with allowances for these difficulties and for some inflation abroad, the British universities seem too reluctant to move ahead. One reason, perhaps, is that they have emphasised economic, political, and social theory or philosophy to the neglect of empirical studies in these subjects. In the United States, on the other hand, the tendency has been to slight theory and to stress " objective " investigation and description of social phenomena. The British universities might well set as their goal a better balance between these two approaches to the social sciences (or the social studies, if preferred) than institutions on either side of the Atlantic have yet attained. Such a balance would permit a much greater development of new fields and of empirical investigation than most British universities apparently have yet contemplated.

In coming to this conclusion, one does not discount the importance of what has already been done—for example, the organisation of Institutes of Applied Economics at Oxford and Cambridge ; the inauguration on a modest scale of research divisions such as those at Glasgow and Birmingham ; and the establishment of Nuffield College, Oxford, for graduate study and research in the social sciences. What is needed is a bolder conception of research in these disciplines and in interstitial fields. The universities should go

beyond the proposals of the Clapham Report, which emphasised mainly the need for co-operation between government departments and the universities in making statistical investigations, regional surveys, and descriptive studies of economic, political, and social institutions. These are the types of investigations, essential as they are, with which until recently the universities in the United States have been too exclusively preoccupied. The vast changes in economic, political, and social organisation and activity that are occurring today in and among nations create the necessity for the investigation of the *dynamic* factors that are involved in human association. This kind of research will draw heavily on the content and methods of social psychology, social anthropology, and human development, and can therefore be conducted successfully only in institutions which possess strong staffs in these fields. In the United States the study of group dynamics has been accelerated by the organisation at several institutions of interdepartmental laboratories for research in human relations, such as those at Harvard University and the Universities of Michigan and Minnesota. Although these laboratories may encourage individual research, they have been organised primarily to undertake large scale research by interdisciplinary teams.

In referring to these developments in American universities, I do not mean to suggest that all the British universities should proceed at once to organise elaborate institutes for research and teaching in the social sciences. I mention them to emphasise that human relationships are multi-dimensional as well as dynamic, and that in order to understand them, we shall have to focus the content and methods of several disciplines upon them; that in general the plans for staff, facilities, and support for teaching and research in the social sciences are inadequate; and that insufficient consideration has been given to the scope and role of research and education in these fields.

Language and Area Studies

In view of profound changes in the world situation, one might have expected to find the British universities experimenting with what American institutions call "language and area studies." Area study is an attempt to use the resources of many disciplines (such as anthropology, economics, geography, history, language and literature, philosophy, political science, and sociology) in an inte-

grated way for the purpose of understanding the culture of a nation region. I found that foreign language departments were making an effort in this direction by introducing some study of history and institutions into courses in language and literature. But such attempts, though commendable, do not fully meet the need to provide a *comprehensive* and *integrated* view of the life and civilisation of a people. The Scarborough Report on Oriental, Slavonic, East European, and African Studies stressed the importance of proper balance between languages and related subjects, such as history, philosophy, and economics. But most universities have shown relatively little ingenuity in promoting area study by arranging inter-departmental curricula, or by devising intergrative courses in the civilisation of an area. This is but one example of the fact that with such notable exceptions as " Greats " and " Modern Greats " at Oxford, honours schools are almost always devoted to a particular subject or department. Furthermore, even if the studies recommended by the Scarborough Report are established, there will still be great gaps in the universities' regional studies. Not much attention is being given, for example, to the history and institutions of the Western Hemisphere. (This may be due in part, again, to shortage of qualified teaching personnel.) Finally, most British universities do not provide sufficient facilities for the systematic study of international relations. These would seem to be serious omissions in both specialised and general education in a period of international upheaval and in a time when Great Britain is engaged in reconstructing her associations with the rest of the world.

Specialisation and General Education

Visitors from the United States are invariably impressed with the intensive intellectual effort that characterises the English student's work in the grammar school and the university. There is little doubt that he possesses much greater mastery of his special subject than his American counterpart both at entrance to the university and at graduation. Furthermore, he is likely to have a broader grasp of his special field. In the United States, particularly in the larger universities which offer many courses open to both undergraduates and graduates, the student, by assembling a snippet of this and a snippet of that, may get only a spotty rather than a comprehensive and fundamental education in his " major " field. Or, he may specialise very narrowly by devoting all his time, except

for an elementary course or two, to one period or one phase of his principal subject. (This is not invariably true, for the smaller liberal arts colleges can offer only a limited number of advanced courses in any one subject, and many institutions require students who are specialising in one department to take courses in related fields.)

But however fundamental the English student's undergraduate specialisation, one wonders whether, under present conditions, he may not have attained it at the expense of a general or liberal education. I found a growing, though perhaps an insufficiently widespread, concern over this problem in the universities. For example, the Vice-Chancellor of the University of Birmingham, in his report for 1947, stated his conviction on the matter in these words: "The increase of student numbers brings into relief what has long been felt as a weakness of studies at this as at most British universities. Our students come to us often with a very poor grounding in general education and receive very little help in this direction at the University."

The problem, apparently, is not confined to the provincial universities. Professor H. J. Paton of Oxford has vigorously criticised the tendency to excessive specialisation at his own university. Behind the system of honours schools in single subjects, he wrote, "lurks the fatal idea that the business of university teachers is simply to turn out university teachers." Pointing out that most university students will not be university teachers, he went on to say: "The university teacher is rightly and inevitably a specialist and has been trained as a specialist. If he assumes, consciously or unconsciously, that the best education is the one which produces specialists, the results are likely to be disastrous ... The bulk of his pupils will have to face—in the professions, in the services, in business, and even in the schools—the struggles and the problems of a world which is very different from the cloistered calm of a university."*

More often than not, however, university staff members with whom I talked defended the specialised honours schools and the intensive sixth form preparation for them. The commonest arguments were that a first-class man in a special field may be trusted with the responsibility of educating himself outside the field,

* Paton, H. J., "Synthesis in the Older Universities." In *Synthesis in Education.* Le Play House Press, 1946.

and that the mastery of one subject produces an intellectual training and discipline that will assure an intelligent grasp of other subjects and prudent action in a wide range of human affairs. In view of the numerous instances in which scholars have displayed a notable lack of objectivity and intellectual expertness in dealing with issues outside their own fields, one may doubt that all first class men will inevitably become broadly educated persons. And even if it were to be admitted that specialisation is sufficient for the top men, what about the second and third class people?

I believe that there may be a residue of general intellectual competence from intensive study of one discipline, and that the most important outcomes of education are generalised mental abilities susceptible of wide application. I am also convinced that experience and evidence indicate that the only way to make reasonably certain that an individual will acquire and apply these abilities competently in a given field is to see that he is given actual training in using the data and the methods of thought which it involves.

Perhaps it is pertinent at this point to ask what are the marks of a general education. They are certainly more than the possession of manners that would make one at home in any drawing room, and more than sufficient familiarity with literature, art, and music to be reasonably comfortable and fluent in the presence of " cultivated " people. General education may well include these graces and enjoyments, but it involves, necessarily, much more in these days. The liberally educated man is, in the words of F. R. Leavis of Cambridge, " the man of humane culture who is equipped to be intelligent and responsible about the problems of contemporary civilisation."* Casual reading and informal discussion in the common room will no longer suffice to acquire that equipment. Nothing short of the most careful analysis of the complicated problems of our time and of their origins and emergence in the course of cultural, intellectual, and social history will be necessary. The degree of understanding required will ordinarily be attained only through systematic study combined over a considerable period of time. I should doubt that by the age of 14, when some students have been able to pass the School Certificate Examination, or even by 16, many students could secure the kind of general education Dr. Leavis has in mind. The only solution would seem to be to

* Leavis, F. R., Education and the University. New York, George W. Stewart, 1948, p. 29.

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* Leavis, F. R., Education and the University. New York, George W. Stewart, 1948, p. 29.

make more room for general education in the sixth form and to extend some part of the student's liberal studies into the university. Furthermore, since examinations dominate the student's education, the only way to assure breadth in his intellectual equipment is to call for it, not only in examinations at entrance, but also in examinations for university degrees. The most serious deficiency in English university education is, in the words of the Vice-Chancellor of Cambridge, " the lack of any school or examination calculated to give an integrative or synoptic view of the modern *Weltanschauung*."*

Although there is something to be said for the breadth of the ordinary degree in the Scottish universities, mere dispersion in itself is not synonymous with general education. The problem, as Dr. Leavis has presented it in " The Idea of a University," is " to bring the special sciences and studies into significant relation—to discover how to train a kind of central intelligence by or through which they can, somehow, be brought into relation . . . a smattering, or even a good deal more, of half a dozen specialisms doesn't make an educated mind."† Separate faculties of arts and of science, and at Oxford and Cambridge separate faculties in many subjects, with relatively infrequent crossing by students from one to the other, make it difficult to attain a unified view of experience or a common educational background. But a different kind of administrative organisation in itself would not ensure true educational synthesis, any more than to require all arts students to take courses in science, or science students courses in arts, would accomplish it. The problem of liberal education in the university, Professor J. MacMurray insisted at the Oxford conference last summer, is to integrate scientific and humanistic education not merely in organisation but in spirit, so that by teaching every subject " in terms of its place and function in the unitary life of contemporary civilisation," a new cultural synthesis can be attained. Although the liberal spirit is deeply ingrained in the British educational tradition, it is in danger of being stifled by the demands of specialism and professionalism. As there is need to bring the science and the arts into meaningful relation, general and specialised education should also be put into better balance. As John Dewey has expressed it: " The outstanding need is interfusion of knowledge, of man and nature, of vocational preparation with a deep sense of the social

* Raven, C. E., Report for 1947-48.
† *Op. cit.*, pp. 25–26. See also the article in this issue by Professor Nef.

consequences of industry and industrial callings in contemporary society."*

Meeting New Demands

But how far should the universities go in providing new forms of specialised training to meet the needs of a changing economic, political, and social order? As one visits the newer universities, he senses a certain ambivalence in their attitudes on this question. On the one hand, there is the scholar's lingering desire to make these institutions conform as closely as possible to the conservative position of the old universities as expressed in the Nuffield College statement on *The Problem Facing British Universities*. On the other hand, there is a growing sensitiveness to the needs of the community and the state for trained personnel in a great variety of fields—education, civic administration, business and industrial management, social work, journalism and the arts, for example. Sir Raymond Priestley forcibly expressed this broader conception of the function of the university in discussing the post-war responsibilities of Birmingham University in his report for 1944:

"I believe that the universities in the provinces and particularly in industrial areas must group their studies to serve the needs of the industrial civilisation from which they draw their students and on the prosperity of which they and the nation depend. It is a question largely of grouping and emphasis; of the scientific study of the principles which underlie business management and planning; and of the application of economics, law, and politics to business and to the organisation of society, just as engineering in the application of the natural sciences to industry . . . The education of lawyers has long been admitted as a proper subject for the university. The education of the accountant can be just as readily based upon university subjects and disciplines, and this is a development long overdue which the majority of universities will view with equanimity and undertake as a duty laid upon them by the inexorable march of time. The important thing is that as many as possible of our professional men should obtain their education in an environment where general humane and cultural development and the cultivation of a scientific approach to problems can proceed side by side with the attainment of professional competence."

The great system of Land-Grant Colleges† and Universities in the United States has developed the scientific and technical possibilities of a great variety of occupations, some of which were originally humble ones indeed, and in so doing has contributed enormously to the wealth and productivity of the nation. The genius of these

* *The American Scholar*, Vol. 13, Autumn 1944, p. 391.

† These are colleges established under the Morrill Act, 1862 which provided grants of land to the various States for the creation of Agricultural and Mechanical Arts Colleges.

institutions is that they have combined education for living and working in such a way as to make intellectual and cultural values operative in the daily affairs of the nation. One feels that ultimately Britain will work out her own counterpart of the Land-Grant movement, if she is to give reality to her new social and economic ideals.

New national needs and upward pressure from the grammar schools will almost certainly require an expansion of higher education beyond the present university enrollment or even beyond the number proposed in the Barlow report. The increase might be provided for by expanding the present provincial universities ; by establishing new universities ; by adding more technical schools ; by creating a new type of school somewhat analogous to the community or junior college in the United States; or by all of these means. The expansion will inevitably entail the provision not only of new institutions, but also of new curricula adapted to students who are capable of profiting from some kind of higher education but who are somewhat less able than those now admitted to the universities.

Important as is the rigorous education of the most gifted students for positions of distinguished leadership and high scholarship—in which Britain has attained pre-eminence—it is insufficient in a modern democratic state. The broader responsibility on the side of specialised training was well put in a letter in the *Times Educational Supplement*, to the effect that " Britain has produced many outstanding scientists, notably men of great brilliance . . . But we appear to lack the immense army of lesser men who are needed to consolidate the ground gained by their leaders."*

Citizens who can consolidate the leadership of distinguished statesmen are equally needed. A democracy cannot exist and grow merely through the creation of an intellectual *élite*, essential as it may be. A free society must have a large body of citizens who are capable of living the good life, who understand the problems of modern society, and who will take a responsible part in public affairs. Furthermore, the highly educated few are unlikely to be recognised as leaders so long as there exists a great intellectual and cultural gulf between the highly educated few and the meagrely educated masses. The British people are moving to narrow that gap by creating a system of universal secondary education. They are beginning to reduce it still further by extending the opportunity for university training to an increasing number of young men and women.

* Brian A. Loveridge, in issue of June 26, 1948.

MATHEMATICAL STATISTICS AND THE UNIVERSITIES

By M. S. Bartlett

Professor of Mathematical Statistics, University of Manchester

In 1662 John Graunt published in England his *Natural and Political Observations on the Bills of Mortality*, the beginning of vital statistics and indeed of the statistical method of investigation. Today most physics students are familiar with "Einstein-Bose statistics," most biological students with the statistics of Mendelian genetics. Why do we use the same word *statistics* in all these cases? Those who think that statistics must always mean information dug out of a "Blue Book" logically have a strong case, but reference to a dictionary will confirm the separation of statistics from the State; and the evolution of a word, as of a species, statistical science itself will warn us is not easy to reverse. The dictionary, while it will tell us that statistics now denote quantitative data in any field, may omit to add that the data refer to individuals only as members of groups, rather than to the individuals themselves. It is this characteristic which has given the statistical method its power and breadth, and identifies it to a large extent with scientific method in general. Scientists, economists and actuaries are all, except in their private lives, interested in what happens on the average.

If any consider this an exaggeration, let them read that stimulating article* "The Statistical Law in Nature," in which Erwin Schrödinger, one of the leading physicists of this generation, notes the rapid growth which the statistical method has achieved among all the sciences, especially in the last century, and remarks "I dare say the first scientific man aware of the vital role of statistics was Charles Darwin. His theory hinges on the law of big numbers. He had not to resort to heavy mathematics; common sense is sometimes an admirable substitute."

The Scope of Mathematical Statistics

Unfortunately the specialisation and segregation of knowledge, especially in the universities, has prevented many from recognising, with Professor Schrödinger, common statistical principles in physics and biology. Since Darwin's studies of biological variability,

* *Nature*, 153 (1944), p. 704.

statistics in biology has been essential for genetics, biometry, and the further modern development of quantitative experiments. This may partly explain the curious fact remarked during the last war, that in spite of the numerical nature of the statistical method research biologists often seemed more at home with it than many mathematicians and physicists, however skilled these were in their traditional sphere. The fault, however, also lay in the limitations of the mathematical curriculum. Even the mathematical basis itself of statistical theory, the mathematical theory of probability, has been neglected in English universities, as though already a corpse instead of one of the most lively developments in mathematics. This in spite of its earlier study by many eminent mathematicians since, a few years before Graunt's empirical statistical studies in England, Pascal and Fermat in France began corresponding about games of chance. No wonder that the most far-reaching recent developments have still come in the first place from outside the English universities—in pure probability theory from the Continent, and in statistical methodology largely from British statisticians, especially R. A. Fisher, working at research institutes.

The subject of mathematical statistics incorporates both these sources into its complete framework, just as its earlier sources lead back in a direct line both to the English practical interest in births and deaths and to the French theoretical interest in gambling. All statistical theory and method springs from this union of statistical practice and mathematical theory. The christening *mathematical statistics* was well meant but perhaps unfortunate. It was no doubt intended to draw attention to the existence and legitimacy of a subject by naming both its parents. But, properly envisaged as the general study of statistical theory and its applications, it is in fact only the head of the remarkable growth already noted in statistics and the statistical method; it should never be severed from the main body of statistical knowledge which gives it life and which in turn it serves. The resulting giant (or ogre?) still pushes his feet deeper among the roots of the physical sciences, yet is always stretching out his arms to those newer branches of science and human affairs once thought beyond his reach.

Statistics and the Universities

The neglect of statistics in the universities has, oddly enough, not been confined to the more theoretical superstructure. The

great British tradition for social and economic statistics was absorbed in a universal development in the last hundred or so years; Mr. H. Campion, in his paper " International Statistics " read to the Royal Statistical Society on January 19th of this year, has noted some of the historical landmarks. Quetelet, the Belgian mathematician and statistician who was tutor to the Prince Consort, promoted the first of a series of international statistics congresses. At the fourth, held in London in 1860, Florence Nightingale contributed with a paper on hospital statistics. Mr. Campion might have added that the " Lady of the Lamp " by her enthusiasm for statistics earned a second, lesser known, title—the " Passionate Statistician."

In 1891 she was corresponding with Francis Galton, Darwin's illustrious half-cousin and pioneer in the study of human heredity, on her proposal for a Chair of Applied Statistics at Oxford. Galton was at the time somewhat diffident about the proposal, as his private notes indicate: " Need of a professor of the theory of statistical methods and the application of them to definite social problems . . . Higher laws of statistics, a mathematical head required . . . Professor will never get a class. Query as to Oxford at all ? and query as to a professor ? He will draw a big salary for certain, but that is all you can be sure of . . . " Thirty years later, when Karl Pearson was writing the second volume of *The Life, Letters and Labours of Francis Galton* (from which the above notes are quoted), he had to remark (p. 418, Vol. II) " We are only just beginning to study social problems—medical, educational, commercial—by adequate statistical methods, and that study has at present done little to influence legislation. What is more, the requisite statistical teaching on which real knowledge must be based has hardly yet spread throughout the universities. The time has yet to come, when the want of a chair of statistical theory and practice in any great university will be considered as much an anomaly as the absence of a chair of mathematics." In fact not until 1948, more than half-a-century after Florence Nightingale's letter, was a Chair of Statistics created at Oxford.

In pure economics, as distinct from social and vital statistics, the divorce of economic theory from realistic statistical studies (with a few notable exceptions) had just before the last war become the source of acrimonious exchanges, and inspired Barbara Wootton to write her *Lament for Economics*, in which she was led to conclude (p. 130) " that, whereas the characteristic method of science is close

observation of phenomena, the economist rejects this in favour of umbilical contemplation."

Finally in 1946 the Clapham Committee on the Provision for Social and Economic Research reported on the " quite inadequate provision which at present prevails in universities in the United Kingdom for posts in statistics."

The general neglect of statistics, both theoretical and applied, by the universities is not unique. The neglect of other subjects also, especially if they straddle traditional departments, has been previously pointed out—for example, by Dr. C. D. Darlington in his recent article* " The Dead Hand on Discovery," and earlier by Professor L. Hogben in *Political Arithmetic* when he noted (p. 46) that " A university is a good house for an accredited science. It is not a lying-in hospital."

However, the post-war impetus to scientific and economic education and research, assisted by various official recommendations, has largely overcome this inertia. In particular, the universities have rapidly been realising the need for more statistics teaching and research, and are now facing the question in the first paragraph: " What is (are) statistics ? " If they recognise its many aspects—the importance not only of economic and social statistics but of medical statistics, educational statistics, biological statistics, and, I will venture to add, mathematical statistics—they have the problem of fitting this sprawling creature into their existing departments without fatal dismemberment.

This problem I found to be confronting the universities as much in the United States and in Sweden, during recent visits to these countries, as in the United Kingdom. It has been the subject of various special reports and discussions, such as:

(i) " The Teaching of Statistics," a (U.S.A.) report of the Institute of Mathematical Statistics Committee on the Teaching of Statistics.

(ii) " The Teaching of Statistics in Universities and University Colleges," a report of the Council of the Royal Statistical Society.

(iii) " The Teaching of Statistics," a discussion before the Royal Statistical Society on April 27th, 1948, opened by Dr. J. Wishart.

While it would be out of place to give here any exhaustive summary of these discussions, some indication of the difficulties and possible solutions may be useful.

* *Discovery*, December, 1948, p. 358.

Difficulties in Teaching Statistics

The difficulties all arise, broadly speaking, from the catholicity of statistics, leading to courses in statistical methods being taught, as the U.S.A. report notes, "in various departments without co-ordination or inter-communication." This report notes also the confused library situation; books on statistical methods being "catalogued and shelved under Sociology, Economics, Business, Psychology, Zoology, Botany, Engineering, and Medicine." It suggests that these evils are incidental to the major one of failure to recognise a coherent, unified science underlying all these miscellaneous applications.

In one or two universities abroad, this confusion has been avoided by a central Institute of Statistics, whose functions include teaching, research and advisory work on both pure and applied statistics. One of these is the Indian Statistical Laboratory at Calcutta; another, the Institute of Statistics in North Carolina. Sometimes partial simplification results from a concentration on particular fields of application at particular universities; thus in Sweden actuarial mathematics and insurance statistics seem associated with Stockholm, economic and social statistics with Uppsala, and demography with Lund. But in a complex university the problem of statistics teaching, especially at the undergraduate level, cannot usually be solved simply. This is frankly recognised in the Royal Statistical Society's Report, which was drafted by a committee containing statisticians of all kinds—civil servants, actuaries, economic, medical, industrial and mathematical statisticians—and which is in general realistic in its recommendations. Its emphasis on the widespread use and need of the statistical approach made me wonder whether sufficient consideration was given to the teaching of economic and social statistics, which are after all of most concern both to the Government and to the general citizen; perhaps this was because of the need to consider at some length the more debatable aspects of organisation concerned with the teaching of general principles.

The report remarks: "It seems indisputable that the teaching of various special branches such as economic 'descriptive' statistics, vital statistics and statistical mechanics should be distributed among the appropriate departments. The main principles of statistical theory, the essential elements of probability theory and their methods of application are, on the other hand, basically common to all

subjects of application, and there are therefore arguments for and against having them taught centrally." After noting these arguments—the sterility and duplication which accompanies segregation, and the separation from current individual applications which accompanies centralisation—the report recommends " compromise, experiment, and variation in treatment . . . each university should establish a recognised centre for statistical methodology . . . In addition, the separate faculties could have their own statisticians and do some teaching, particularly of special application . . . "

The Place of Mathematical Statistics

The report adds further: " Clearly where an important school for training and research in statistics exists or is planned, it should form an autonomous department. Elsewhere the statistics centre will need to be attached to an existing department, and we think this should be the mathematics department. Mathematics is at the root of the theory and methods of statistics; moreover, the relation of statistics to other scientific subjects is very like that of mathematics, and similar organisational relationships are appropriate. The latest practice in several universities that are developing statistical teaching is in accordance with this view . . . "

However, it should be realised that the external responsibilities of the " statistics centre " are both broader and more variable than the traditional mathematics department, whose " applied " branch has previously been most closely linked with mathematical physics. The teaching responsibility includes statistical methodology as well as statistical theory; moreover, any common courses attended by students with variable mathematical ability and from multitudinous departments have their own complications. If the departments or faculties are to maintain contact with the " statistics centre," reciprocally this must maintain contact with all of them. Of course the mathematical statistician cannot do this without active co-operation from them and probably also by his own partial specialisation according to circumstances. Co-operation is stimulated by his advisory function, though this again implies still further obligations. Interchange of students at the postgraduate level is also possible.

The necessary co-ordination will certainly not be automatic. The Statistical Society's Report suggests that " the appointment of a joint committee or board of studies to secure co-ordination and

co-operation appears essential," though perhaps the mutual wish to co-operate is even more important. The provision of a central statistical laboratory, which seems advisable if large-scale tabulation or computing is needed by more than one department, may assist. If the British flair for compromise does achieve the right solution, it will not be without continual effort, adjustment, and experiment.

Statistics and the Individual

In spite of the universal application of the statistical method, or perhaps because of it, one is aware that this somewhat prolonged and technical discussion of its role will fall harshly on some ears and may give an impression of blindness to things outside its scope especially in a journal devoted to all aspects of university education. Many are rightly uneasy of the growing regimentation of life, and perhaps associate statistics with much that is, as Bertrand Russell so strongly emphasised in his Reith lectures, impersonal and devitalising in modern controls and regulations. It is true that in statistics the individual as such plays no part, but this does not imply that statistical laws never apply to man, or that he does not need statistical information. As the late Sir Arthur Eddington remarked,* " Human life is proverbially uncertain; few things are more certain than the solvency of a life-insurance company."

The scope of individual achievement and freedom can never be fully grasped if we remain ignorant of the extent of macroscopic statistical trends, both in the natural and in the social sciences. Again, an undernourished child is not more a tragedy if multiplied a thousandfold, but relief measure will only be completely effective if we know how many require food. Florence Nightingale, who had the imagination and compassion to see through the statistics to each individual, well knew this. If we cannot all say with Francis Galton,† " Some people hate the very name of statistics, but I find them full of beauty and interest," at least let us recognise their essential place in the administration, and in the natural and social philosophy, of the modern community, and hence their essential place also in university education.

* *The Nature of the Physical World*, p. 300.
† *Natural Inheritance*, p. 62.

SPECIALISATION AND GENERAL EDUCATION IN THE SIXTH FORM

By Eric James

High Master of the Manchester Grammar School

Few ideas about higher education receive more widespread and uncritical acceptance today than that entrants to the universities are lacking in general education, and have been the victims of over-specialised teaching in the schools. This belief has recently provided one of the most widely-used arguments for the imposition of an age-limit in the new General Certificate of Education; the new entrance requirements suggested by the universities have been framed under its influence. The question is manifestly a very serious one. But without wishing to minimise the evils of specialisation or to defend our sixth form curricula, it may nevertheless be claimed that the problems raised by the charge of over-specialisation are far more complex than is sometimes assumed, and that the remedies proposed may well produce evils worse than the disease itself. Thus, while it is unfortunately only too true that many undergraduates are " uneducated " in the sense that they do not talk or read about topics apart from their own subjects, this state of affairs arises from causes both deeper and more various than one would gather from many recent pronouncements. To claim that generations of students are being held back from a wide culture, for which they thirst, by narrow teaching in a number of schools, dominated by those supposed villains of the piece, Oxford and Cambridge scholarships, is simply naïve.

It is essential to remember, as a preliminary to any rational discussion of these questions, that we tend to judge general education by standards inherited from a time when the much smaller numbers in the universities included a higher proportion of the quite outstandingly able, for whom general education is rarely a problem, and of those coming from educated backgrounds; from a time, moreover, when the distractions from the pursuit of general education by the most effective of methods—reading and serious conversation—were not nearly as great as they are today.

What is " General Education " ?

It must also be remembered that behind all the controversy concerning specialisation lies an unresolved confusion. The ideal

at which the schools are encouraged to aim is that of a "broad, general education." Better, we are told, if our future medicals learn no biology at school; even, it is sometimes said, better if they learn no science at all, as long as they possess this breadth of background. Yet unfortunately we are completely vague as to what constitutes such an education for the kind of people who go to the university. In their most recent entrance requirements the universities are maintaining that a knowledge of any foreign language and of science or mathematics, up to the credit standard of school certificate, are part of it. Oxford and Cambridge, it seems certain, will be more precise; for them the general background for all students must include that knowledge of Latin which can be crammed into unwilling scientists in about six months. Now these demands may be legitimate; but it would be idle to pretend that they rest upon any coherent or considered view as to what body of information, what skills and attitudes we can and should demand from every student whatever his special subject, or upon a well-founded belief that school certificate French offers the best bulwark of the general education of scientists in the sixth form. Until the universities and the schools are prepared to devote in collaboration much more resolute and constructive thought to it, little real progress can be made towards the solution of the problem of the nature of a general education. It may be of some value, however, to draw attention to some preliminary considerations which should weigh with us in attacking the related question of over-specialisation.

First, then, there is little doubt that those who attack specialisation in the schools are far too ready to overlook the educative value of depth in a study. It is frequently claimed that the work done in many sixth forms is too advanced; that ground is being covered by the schools that is traversed again in the universities. But in schools, as in universities, for the kind of student we are considering there is no substitute for the intellectual and, I would add, moral stimulus of grappling with really difficult ideas in a chosen subject. That is why, of course, the performance of a piece of research, however humble, is not a narrowing but a broadening experience if we consider the personality of the student rather than his stock of information, though it is an educational technique that is not generally possible in schools. It is unfortunately true that many criticisms of the high standards reached in sixth forms ignore this aspect of education as providing depth of experience. A boy will

trespass into first year university work, not because he is driven to do so in order to win a scholarship, but because he enjoys pushing on to prospects that he finds challenging and exciting. Great harm will be done to education in its broadest sense, if our approach to sixth form studies is to find out what a boy likes doing and make sure that he does not do very much of it.

Educative Value of Specialisation

There is another error into which we may fall, if our fear of specialisation in the schools becomes too great, that of overlooking what should be the first approach to the building of a general education, the approach through the specialist studies themselves. No effort must be spared to ensure that we obtain from these studies as many as we can of the values which we associate with a broad culture. There is no doubt that, if it is followed in the right way, the study of science, for example, can be made to encourage that rigour and clarity of thought that we usually associate with linguistic studies, and even to satisfy that need for creation which is often assumed to be the monopoly of the arts. There is a tendency to associate certain kinds of value too exclusively with particular kinds of study, and to ignore the possibility of realising them through others. Further, the specialist subject itself must be related to other fields of knowledge in every possible way. Such an end will be achieved not only by deliberate teaching but by the whole attitude of the teacher, that nebulous but most potent factor in all education. A historian who shows that he has learned enough science to appreciate its influence on the life and thought of our time, the scientist who has read, say, the books of the Hammonds or of Professor Farrington, will have, perhaps unconsciously, the stimulating effect on their pupils which leads to the further reading, which means that the battle against over-specialisation is almost won. All this demands much from the specialist teacher, but that is true of any attempt to solve the problems of general education. It does not invalidate the main contention that the first approach must be through the specialist subjects themselves. We are in danger of regarding " culture " as something that has to be applied as it were from without, rather than as growing up from the work to which the student's abilities and interests are devoted.

Essentials of General Education

If this is true, however, it is none the less plain that every sixth

form pupil must follow studies other than his principal ones. What are they to be? In attempting to answer that question the first error into which we may fall is to multiply their number excessively. If in our pursuit of the ideal of a "wide general education" we prescribe too many necessary subjects, we shall fill the time of the student so completely that any prospect of self-education will vanish. The 19th century classical curriculum was absurdly narrow and over-specialised by our standards, yet it would be foolish to deny that it produced a succession of men of the widest culture. It was able to do so because it supplied two of the essential elements of an advanced education, depth in a limited field and leisure in an educative environment. The pupils had time to read for themselves and the opportunity to talk to their fellows, and the best of them used it, as their biographies clearly show. The background of many of our students is not in the same way an educative one, but neither their more difficult task of self-education, nor the task of the schools in attempting to remedy the deficiencies of society, will be made easier by an excessive demand of subjects apart from their specialist interests. Even more foredoomed to failure as means of general education is the attempt of universities to broaden their students by making them follow several subjects to a fairly high level. The chemist who must "get up" to degree level the physics and mathematics at which he is less good, is often a much less broadly educated person (and, therefore, incidentally a less good schoolmaster, though it is for schoolmasters that such courses are often proposed) than the apparently narrow specialist in one field.

Fallacy of Non-Specialist Subjects

The other error into which we may fall as regards non-specialist subjects is to imagine that it does not matter what they are, so long as they are unrelated to the specialist work. Such a purely negative attitude can only arise from the ignorance, to which I have referred, as to what constitutes a general education. Until we reach some clearer insight into this question we shall presumably have to continue teaching French to sixth form scientists or mathematics to classics because in some curious way it is "good" for them. From the uncertainty surrounding the nature of this general education arises an important principle concerning non-specialist sixth form work. It must be experimental in character, depending upon the intelligence of particular groups of pupils and still more

upon the interests and capacities of the teachers. If we agree, for example, as I think we should, that every boy and girl going to the university from our schools should have some knowledge of the forms and nature of government, the method of approach must still be left to the individual teacher. One may approach it directly through civics or modern history, but another may find that to this, as to so much of the material of general education, there is no better introduction for very able pupils than the simpler dialogues of Plato. Work of this kind, of course, makes great demands upon the teacher; he must not approach it with the idea of repairing the glaring deficiencies in the education of a group of barbarians; he must be capable of establishing relationships as far as possible between what he is teaching and the pupils' special interests. The whole use of the term "unrelated subject" is unfortunate; it implies the existence of those barriers between fields of knowledge which it is one of the chief objects of a truly general education to break down.

If we ask with more persistence and honesty than we usually do what exactly we expect to get from non-specialist subjects we can see some of the lines on which experiment must take place. Why do we say that it is "good" for the sixth-form scientist to learn Latin? The answer must surely be that in the past a knowledge of classical literature made a unique contribution to the education of all such people. But this contribution cannot be obtained by a compulsory study of elementary Latin; it is simply mistaking the shadow for the substance to revere the mere rudiments of a language which once provided the key to the culture of all educated men The remedy in this case seems to be obvious; it is to give as a substitute some familiarity with the classics in translation. Admittedly much is lost in this way, but that loss must be accepted, because there is no alternative. In the same way, when we say that it is "good" for all sixth-form students to know some science, it is of its broad conclusions, its method, and its effect on man's life that we are thinking, rather than of its simple factual basis. Thus, just as we shall be wrong if we believe that the scientist is improved by a knowledge of school certificate Latin, so we shall be wrong if we think that the classic will get what he needs for general education from physics-with-chemistry in the general certificate of education. What is needed is some much more radical approach to which the continuance of these over-simple requirements will be a positive

obstacle. We must evolve new curricula and new methods by a period of experiment and discussion which may in time produce some picture of the kind of general education that we need. Above all we need a re-examination of the whole idea that such an education can be tested at all by a number of unrelated papers set on fragments of the whole possible field.

Responsibilities of the Universities

The universities have thus three major responsibilities in this field of general education in the schools. First, their entrance requirements must be framed in such a way as to provide a stimulus, or at least not a check, on the experiment which is now going on in many schools. Far greater than any direct influence that they may exert in this way, however, are their more fundamental responsibilities. By collaborating with the schools in conference and discussion they must make a more informed contribution to discovering a more educative pattern for sixth-form studies. But the most vital task of all is to send back to the schools the kind of teachers without whom any conception of general education must remain a pious aspiration; men and women, that is to say, who are anxious to transmit and interpret the inspiration they have obtained in their time at the university. If in the years when these future teachers should really be developing some knowledge of the perennial problems of the life of the mind, the standards which the university reveals to them are uncertain or inadequate, then the universities in turn cannot expect the students that their graduates have taught to possess the breadth of vision that they so rightly desire.

THE COMMITTEE ON SOCIAL THOUGHT OF THE UNIVERSITY OF CHICAGO

By John U. Nef

Chairman, The Committee on Social Thought, University of Chicago

During the past one hundred and fifty years the course taken by history has been in directions different from those which have guided graduate study and scholarship in the world's universities. As a result of the new powers which science and engineering made available, all parts of the globe have been drawn into close interdependence. Each part has been filled with people; moving frontiers, like the one which existed in North America until the 1880's, have disappeared; insofar as the interests of humanity are concerned, political frontiers have become meaningless expressions of an age which the industrial revolution has left behind. The only problems which can arrest the attention of men and women everywhere are universal problems.

The need for a universal language which has resulted will not be satisfied by an Esperanto. Words can acquire a common meaning only when there exists a common understanding of the great experiences which all men and women share. There is no lack of words in the modern world. What are lacking are common sentiments and ideas, a common concept of a word such as the word "democracy." The need is for a substantial agreement on the great recurring issues of religion, philosophy, morality and art.

Yet learning and letters have been concerned increasingly during the past one hundred and fifty years with the particular rather than the general, with small special issues—resulting in regional studies even studies of a special city, town or small community. This movement has been pushed to the point where so universal a medium of expression as music or painting, which everyone can grasp without a knowledge of language, is treated as regional and sectional. Instead of gaining ground, the concept of humanity above all nations, which existed in Europe in the eighteenth century, has lost the serious and informed reality that it once possessed. Two centuries ago Montesquieu wrote, "If I knew of something beneficial to me but harmful to my family, I would eject it from my mind. If I knew of something beneficial to my family, but not to my country, I would try to forget it. If I knew of something beneficial

to my country but harmful to Europe, or beneficial to Europe but harmful to the human race, I would regard it as a crime." This lofty sense of the mission of universality was shared by many distinguished eighteenth-century men, such as Burke and Gibbon, who spoke and wrote of Europe as "One great republic."

The Disease of Specialisation

The narrowing view of the responsibilities of the mind since the French Revolution, has been accompanied by a continued narrowing of the scope of scholarship. The two developments are undoubtedly interrelated. Comte was much troubled about the tendency toward specialisation when he wrote his *Cours de Philosophie Positive*, the last volume of which he finished in 1842. The divisions that have since appeared make the scope of individual research and writing in Comte's time seem very wide, the treatment of subjects very general.

The history of political economy may serve as an example With Adam Smith the subject was closely knit both with statesmanship and with moral philosophy. In the late nineteenth century the economist was inclined to construe his obligation to be that of showing how goods could be produced in larger quantities, and distributed in the manner best suited to further increases in output. Which people should produce the goods, whether it was desirable in the interests of general happiness to produce some of them at all, were construed as questions for statesmen and philosophers. It was no part of the economist's task to inquire whether the statesmen or philosophers had the mission or the knowledge to settle these questions for the benefit of humanity. By the early twentieth century, economics itself was divided into a number of specialties. In the United States the graduate student, seeking the doctor's degree in economics, is offered a choice of many fields of specialisation, such as theory, money and banking, labour relations, statistics, accounting, economic history, history of economic doctrines, etc. In her recent book on George Eliot, Mrs. Bennett has suggested that specialisation is the occupational disease of the modern university.

Establishment of the Committee on Social Thought

The manifold problems which this disease presents led to the formation seven years ago of the Committee on Social Thought at the University of Chicago. It was started by a small group of men

associated with Chancellor Robert Hutchins, whose work for educational reform is already known in Great Britain. Gradually a small faculty has been built up as an integral part of the University of Chicago, but independent of the departments. Along with this faculty there is now a slightly larger group of graduate students and young scholars, chosen from many applicants. There is a two-fold basis of selection. Candidates are chosen because they have successfully demonstrated by their written work, or in the case of the youngest candidates have shown remarkable promise of demonstrating, a capacity to bring into an appropriate philosophical relationship two or more subjects which are treated separately by modern learning. They are chosen also because there is reason to believe that ideas, scholarship, and literary excellence constitute a life passion for them, and are not mere passing whims.

The movement toward extreme specialisation in scholarship has been accompanied by another movement which prolongs the system of the grammar school into adult life, and almost confounds the preparatory school and the university. Graduate students who may be in their thirties, or even in their forties, are obliged to accumulate what are known in the United States as "course credits"; that is to say, they are obliged to follow a stipulated number of lecture courses and seminars, many of which are prescribed, and at the close of each course to pass an examination on its subject matter. Two or three years of routine labour of this kind, in addition to the composition of a thesis (the subject of which is often set by a professor), are required for the doctor's degree. The notion of the advanced student as a junior colleague, which used to prevail in England, never took hold in the United States. Instead, as the number of graduate students multiplied, universities came to resemble factories, in that work for degrees was fashioned according to a prescribed pattern, under the direction of instructed foremen.

The Committee's Aims and Organisation

For this system of instruction, the Committee on Social Thought has endeavoured to substitute liberty under guidance and self-discipline. No subject of importance to man is regarded as outside the range of the Committee's work, provided adequate supervision can be found for the student. In this connection the Committee has solicited the help of professors in the humanities, the law school,

the theological school, and the natural sciences, as well as in the social sciences, in other universities as well as in the University of Chicago. These professors have shown a most gratifying willingness to co-operate in guiding students.

In choosing their work, the students must have the approval of the Committee and any other professors especially concerned. But there are no "course" or "field" requirements. There is no obligation to attend formal lectures. For the faculty there are no prescribed subjects. Each member chooses the subject upon which he lectures and the number of lectures he gives each year, somewhat after the fashion of the Collège de France in Paris. In addition he accepts responsibility for the guidance of a certain number of students.

Two characteristics of modern knowledge present difficulties which seem almost insuperable to the scholar or thinker who is seeking for the universal in his special subject. One is the enormous quantity of information, of ideas, of theories. The other relates to the almost innumerable divisions into which knowledge and art are split. In the view of the Committee on Social Thought, the possibility of surmounting these difficulties rests in a combination of an instructed view of man and the universe (a view which can be derived from the great intellectual and cultural traditions of which we are heirs) with the creative union of two or more special subjects, which range all the way from physics to economics and from political thought to poetry.

The Committee on Social Thought has established a core of study which is called "The Fundamentals," conceived with the object of binding the independent work done by students and scholars into a common intelligibility. (For example, any student embarking on a study of inter-relations between economic, military, and intellectual history will be at a disadvantage unless he has a thorough general knowledge of—among others—the works of Thucydides, Aristotle, Cicero, Augustine, Aquinas, Grotius, Hobbes, Newton, and Comte.) "The Fundamentals" is conceived with the further object of giving the independent work order, form, and style,-which will make it understandable to the serious public, insofar as possible independent of place and time. (Nothing is perhaps more helpful in connection with style than to have constantly before one models provided by Plato, Chaucer, Shakespeare, Bacon, Johnson, Burke, Racine, Goethe, Montaigne.) Students are expected to gain an understand-

ing of philosophy—of both epistemology and ethics—which will permit them to make use of new and particular knowledge in relation to human happiness conceived as a whole, both for individual men and for societies. Students are expected to gain an understanding of history, which will enable them to recognise how all sides of human activity are interrelated.

The master's degree is designed for a new kind of scholarly teacher or leader—a teacher who will be capable of guiding and directing college and university students effectively in a more integrated and general training, such as is now being developed in a number of American colleges and in the British universities; a leader who will be capable, whatever vocation he enters, of approaching its problems on behalf of the general interests of humanity. The doctor's degree is designed for persons who have a flair for creative thought, or even art, who show promise of being able, by their works, to instruct and charm a serious world public with general interests.

Candidates for degrees are tested by a general written examination, which extends over a series of three or four days, and by the presentation of written work of a high order—various papers, if the student is a candidate for the master's degree, and a more extensive and sustained piece of writing if he is a candidate for the doctor's degree. A candidate for the doctor's degree is expected, in addition, to deliver a public lecture, setting forth the contribution which he has made to the objectives for which the Committee exists.

Specialists in Interrelations

Comte's proposal for meeting the problems of over-specialisation was to create specialists in interrelations, who would settle all issues by positive methods of handling evidence, derived from the natural sciences. Neo-Comtians, who propose to unify knowledge by specialising in interrelations, are numerous today in the United States. But to specialise in interrelations has frequently meant to adopt the vices of specialisation without the virtues. This form of labour contributes to superficiality. What is needed is not a bit of everything, but an appropriate selection of subject matter and methods in which a man can become a master. Specialisation is fundamental to the achievement of great results; it is only by limiting a subject that there is any possibility of speaking in universal terms. The vital matter is that the subject shall be limited, both as

to matter and as to methods of using the matter, by a rational effort to achieve a universal purpose, rather than narrowed, merely for the sake of a result that is novel, regardless of its importance for man.

Unification of Knowledge

The Committee on Social Thought is convinced that the problems of universal understanding, to which it aims in all humility and modesty to make a contribution, are not to be met either by the use of scientific methods alone or by the imposition of any of the existing dogmas, whether religious, political or economic. The Committee represents, we hope, a return to the Jeffersonian tradition of freedom of inquiry in which the American Republic was founded. Yet the Committee represents a sharp break with the current American dogma that science and engineering, medicine and surgery provide means of unifying knowledge and human beings. Here, as in the matter of the formalities and methods of graduate instruction, the work of the Committee presents a notable alternative to the accepted procedure in America and in other countries, among them Russia, a procedure which assumes that paradise can be achieved simply by technical progress, the multiplication and the more equitable distribution of this world's goods.

Several religious persuasions are represented in the Committee. These range from Roman Catholicism to agnosticism. Many kinds of scholarship are represented, from philosophy to history and to anthropology. Before long we hope the Committee will have on its staff a natural scientist and a man of letters. We are of the opinion that all these religions and all these learned disciplines have something to contribute to the formation of a universal intellectual community, provided the men who represent them are aware of the limitations of their special institutions and subjects, and are striving to transcend them in their search for Truth.

Studies and Research

The time is coming—perhaps it has already arrived—when the Committee on Social Thought must be judged by its fruits. Works have begun to appear. Professor Otto von Simson has just published a book entitled *Sacred Fortress*. In it he has managed to show the relations between art, politics and religion at Ravenna in the time of Justinian. Simson was the first executive secretary of the Committee on Social Thought and he is soon to edit a journal called " Measure," whose board of editors has been chosen from the

Committee on Social Thought. Chancellor Hutchins is chairman of this board of editors. Daniel Boorstin's recent book, *The Lost World of Thomas Jefferson*, has received some attention in England. It represents one of the first attempts to consider as a whole the intellectual history of the United States, in its relation to history generally. Professor Robert Redfield, the distinguished anthropologist, is soon to publish a volume in which he examines the position of a small Mexican village in relation to the great industrialised world into which it is being pulled. Further books are on the stocks. One is by David Grene, the new executive secretary, who was trained at Trinity College, Dublin. His book is concerned with the significance of Thucydides and Plato inside of a new interpretation of the Periclean age and its meaning for today. Professor Yves R. Simon, the Thomist philosopher, has nearly ready a "Philosophy of Democratic Government," while P. H. von Blanckenhagen, the classical archæologist, has nearly finished a work called "The Image of Man in Greek and Roman Art." Other books deal with the interrelations between war and industrial civilisation, and with the nature and meaning of "democracy," a word which stands in such dire need of clarification.

Special hope is put by the Committee in the work which its students have in hand. Limits of space prevent me from going into detail. I must confine myself to the studies of two men, each of whom gave up four critical years of his life to army service in the European theatre. One of them is writing on the period of Melville in American letters, and out of his work should emerge a better understanding of the peculiar American sense of time, which led to so much hurry and noise, and gave rise to a neat remark of Henry James, that this is a country where the landscape is made for the railroads. The other book is devoted to late fifteenth-century Florence, and in particular to Lorenzo de Medici. Based on materials in Italian archives, this book should bring out the significance of the view which the Italian mind took of all sides of life as art. The book should help us to understand an attitude which had much to do with keeping warfare within bounds during the three centuries when a modern sense of European community developed, from the time of the Reformation to the French Revolution.

The Committee on Social Thought began its publications two years ago with a volume called *The Works of the Mind*, edited by

Robert Heywood. In it a number of eminent men of our time, in art, thought, science, and in affairs, set forth the nature of work in connection with their specialties. Their papers show how work of integrity in the most diverse fields has a common purpose and a common intellectual origin in a combination of what Pascal called the *esprit géométrique* and the *esprit de finesse*. Among the contributors to the volume were Marc Chagall, Arnold Schönberg, Frank Lloyd Wright, Professor Charles McIlwain, ex-Chancellor Bruening, Senator Fulbright, John von Neumann, the mathematician, and Alfeo Faggi, one of the best modern sculptors.

From these names, it is apparent that many nationalities are represented. The community which the Committee would like to serve transcends the universities and the nations. It is the community on behalf of which Montesquieu wrote. During the present year at least five out of the dozen members of the Committee's active staff have been abroad lecturing at the invitation of foreign universities, in England, Germany, Sweden, France, Mexico, and China. One member, Edward A. Shils, who shares with David Grene the duties of executive secretary, has a joint appointment with the London School of Economics which keeps him in Great Britain for a part of each year.

International Co-operation

Five or six of our students are in Europe at the present time. In return we are expecting European students who share our objectives here in Chicago. A start has been made with the University of Paris. The Committee will have each year one student whose training began in the University of Paris, while the University of Paris will have each year one student whose training began under the Committee.

Of immense value have been the visits paid the Committee by foreign thinkers, artists and scholars, among them Professor R. H. Tawney, Professor A. P. d'Entrèves, H. S. Bennett, Professor Jacques Maritain, Dr. Artur Schnabel, and Professor Arnold Toynbee.

Continuous international relations of these kinds are vital to the Committee's purpose. One of the causes for intellectual atrophy in university communities is their ingrowing character. The members of the faculty are inclined to think of any problem in terms of the local rules and regulations, even the local social life of

their university. They are inclined to forget that unless the university serves the world, it has no reason for existence. By the formation of an international group of sponsors, the Committee should be continually reminded of its responsibility to serve the universal.

It is indispensable that work of the kind the Committee on Social Thought has undertaken should be carried on in an intimate way, independently of the means of mass communication—the radio, the cheap newspapers, and magazines, which have done so much to mechanise what should be natural, to stereotype what should be creative, to cheapen what should be valuable and even sacred. As Henry Adams wrote, "Any large body of students stifles the student. No one can instruct more than half-a-dozen students at once."

With the triumph of industrial civilisation all over the world in the past one hundred and fifty years, the intelligent cultivation of the creative life outside the universities has all but disappeared, at any rate in the United States. It is part of the obligation of the Committee on Social Thought to help in reviving this creative life. The attitude toward knowledge and art which a group like the Committee on Social thought hopes to exemplify, together with the discoveries which it hopes to make, will have to be disseminated in ways that do not destroy their meaning and value. While the members gathered together at any time must remain small, the students will be going out in the world. The Committee will encourage the formation of other groups with similar aims. To the development of these some of the students can contribute. Others, who enter fields such as politics, journalism, or art, can help to humanise, universalise and internationalise these fields. As Voltaire once wrote, "A historian has the duty, without being a pedagogue, to instruct the human race." The same is true of all the other disciplines which are associated in the Committee on Social Thought.

RESEARCH AND TEACHING

By E. G. Phillips

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In a recent issue of the *Universities Quarterly** this sentence appeared: "Nevertheless, important as research and the training of students to carry on research may be, it would be unfortunate if a higher premium were placed on research than on teaching." This sentence provides me with a text upon which to base some observations which I feel need to be made at this period with courage and conviction, however unpalatable in some quarters they may be.

A century or so ago men were occupying chairs in universities because they had secured good first-class degrees, sometimes in more than one subject, and because they had an encyclopaedic knowledge of their special subject. Men with the same equipment applying for chairs, or even lectureships, to-day would not be seriously considered. In a later generation young graduates of Oxford and Cambridge, inspired by their teachers to pursue research, were sometimes led to complain bitterly that, when appointed to junior posts, where the professor was a man of the type mentioned above, they had little or no encouragement to pursue their researches. By to-day the pendulum has swung to the opposite extreme and research has come to be regarded as the main function of a university teacher. It is doubtful whether ability to expound one's subject to students has ever counted for much in choosing men for university posts, but when "research with a capital R" came to be the chief requirement for advancement in the profession of university teacher, ability to teach was generally entirely ignored.

When I contemplated entering the profession twenty-five years ago, I well remember a conversation which I had with a distinguished Cambridge don, in the course of which the term "hack lecturer" was used almost as a term of abuse! I was under no misapprehension then about the low opinion held by many Cambridge dons of the man who entered the profession and became merely "a good teacher."

It has been abundantly clear to me for years now, both from my experience as an undergraduate, and still more from my experience as a university teacher, that in many of our university departments the much abused hack lecturer has been, and still is, the backbone of

* May, 1948, p. 251.

the department. Most students in a university department are quite unable to differentiate between one lecturer and another by the criterion used by those who make university appointments. They can, however, and do know the difference between a lecturer with ability to teach and expound his subject with clarity and vigour and a lecturer whose presentation is airy, vague, and ill-prepared. Generalisations are dangerous and often misleading, but it may well be the case that the lecturer of the first type is one of the much abused hack lecturer class and the one of the second type a most distinguished researcher.

It is a well-known fact, and it is time that university authorities frankly admitted it, that the most distinguished researcher may be a hopeless exponent of his subject, especially at the more elementary stages, whereas there are many men and women in the profession, who, for various reasons, have no formidable list of publications to their credit with which to impress appointing bodies, but who nevertheless fulfil the valuable task of expounding their subjects vigorously and extremely well.

It is certainly true in my own subject, and probably in many others as well, that, from among the students who graduate annually with first class honours in all our universities, the number who have a real flair for original research is quite small, and, not all of these are attracted to university teaching. By the term " original research " here I do not mean " directed research." Probably most of the first class honours graduates in our universities would be capable of doing directed research under a good supervisor, but such success is not by any means a criterion of ability to carry out original research. Ever since the great expansion in university numbers after World War I, men and women have been appointed to university staffs who have failed to fulfil the promise of a brilliant undergraduate career by becoming first-rate original researchers. Now, after World War II, when it is expected that the student population of our universities will be 90,000 by 1955, if this vast number of students is to be taught at all, many of them will have to be taught by staff, many of whom will not prove to be men with a flair for original research.

It seems abundantly clear to me that universities will be compelled, during the next decade, by the mere increase in numbers of students, to appoint the best candidates they can find for their teaching posts and will not be able, as hitherto, to dismiss those who are unable,

after three years to show some "published work." In fact, "research with a capital R" will necessarily have to play a smaller part in deciding who is fit to be retained on university staffs. If this results in forcing appointing bodies to pay less attention to mere weight and volume of a university teacher's published papers and take a wider view of the meaning of "research," it may be a good thing. It is a truism that at the university level teaching becomes enriched by research, but it is a fallacy to maintain, as some still try to do, that "published work" in itself is the only criterion that research has been pursued. I remember hearing of a discussion between two "experts" of an aspirant for promotion to a chair and one of them said: "Mr. ——— is merely a well-informed ———ist." This is the kind of comment one expects from those who still judge research by weight and volume and fail to give any credit at all to the wide reading a man may have done to keep himself abreast of the work done by others, thereby enriching his own scholarship for the benefit of those whom he teaches.

No real improvement will be made until more value is placed on good teaching work done by a university teacher. The fact remains, however unpalatable it may be to those in authority, that in the past men who have grossly neglected their teaching duties in order to have more time to prosecute research with a view to their own advancement have often gained the promotion they sought, whereas others who have put their students' interests above their own have had to remain in inferior positions.

It should not be forgotten that, owing to inadequate remuneration, many university lecturers have been obliged to use up much of their energy in examining work, especially if they have families. Others have ruined their health, and even lost their sanity, largely through overwork, in a futile attempt to produce publications, when they have no real flair for original research, because they knew that their promotion depended on that sole criterion. And such men have sometimes been excellent teachers, who, had more recognition of their value been given to them, might have been happy, contented members of a university staff instead of the disgruntled, embittered men they have become.

The only research that is really worth while will always be done by the few who cannot help doing it, but universities will be compelled before long by circumstances to recognise that there is a place for really good teachers as well as for good researchers on their staffs.

The old practice of treating good teachers as inferior to good researchers will have to go. The best men will no longer be attracted to a profession in which there are not reasonable prospects of an adequate salary being reached by *all* once they are accepted into permanent appointments. Although there have been recent improvements in salary scales, the large gap still existing between the salary of a professor and a senior lecturer needs to be made much smaller. In the present salary scales in the University of Wales that gap is larger now than it was before salaries were increased.

It is time that all university authorities took more account of the fact that there are men of distinction in research who are unfitted for teaching students and men without such distinction who are invaluable members of university staffs. It may not be possible to give all men of the former class research posts without teaching duties, but it seems to me that the time has come to reorganise staffing in universities in such a way that the best use can be made of both types of university teacher. Many first class researchers who are heads of large departments, and even some who are heads of small ones, complain that their progress in research is hampered by numerous administrative duties, attendance at committees, and so on. Many professors would be happy to delegate some of these necessary duties to a senior lecturer, who, for one reason or another, is unlikely to add any more contributions to knowledge. But a conscientious professor cannot feel happy about doing this when the senior lecturer is paid little more than half the salary he is receiving himself. There would be no difficulty, with a little reorganisation, in instituting two classes of senior appointment, carrying comparable salaries, one of which would be for *research* professors, the other for *administrative* professors (or whatever other title may be deemed suitable). This is one way whereby university authorities could recognise more adequately the valuable services which so many senior lecturers have rendered to their departments. It would also free men of first-rate research ability to carry on their researches unhampered by duties which many professors now engaged in research find so irksome.

PROFICIENCY IN LANGUAGES

By P. Mansell Jones

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The valuable discussions of the present state and prospects of modern studies in our universities which have already appeared in this review[1] have helped to clear the air about certain essentials, such as the balance of contents and future applications. But they have omitted to refer, at least explicitly, to an aspect of the problem which is the *sine qua non* for almost all work involving foreign media, and which must in particular affect or determine the degree of success to be achieved in dealing with whatever content or objective characterizes such courses as are provided for undergraduates. I refer to the degree of proficiency attained in the use of a language in its modern or contemporary forms.[2] What can be done with or through a language obviously depends upon how well the language is known. The paradox of the present situation is this. We are liberally contriving opportunities (or compulsions) for thousands of young people to learn languages without our being equally concerned to ascertain whether the languages are being learned or not by anything like the whole of this multitude of intended beneficiaries.

Variable Standards

Not concerned to ascertain ! it might be interjected, when one elaborate examination system is about to be exchanged for another which, it is hoped, will be at once more generous and more searching. Most people, I think, who have watched the machine at work temper their respects for the rigour of its operations with doubts about the inerrancy of its discriminations. Many at least would agree that public examination results are by no means invariably reliable as exact records of proficiency in languages.

To avoid misunderstandings, certain reservations to the implication of these remarks must at once be admitted. They are not, for example, intended to apply to the very best pupils at the Higher

[1] I refer especially to Professor Peacock's article in *Universities Quarterly* for February 1948, and Professor Entwistle's in the number for August 1948.

[2] Here I propose to deal predominantly with French as the most popular of foreign languages. But much of my argument also, I think, applies not only to other modern languages, but to the classical languages as media with which it is necessary to be securely familiar, at least in their written forms, before they can convey much of real value to the student.

stage, still less to the most brilliant of Honours students. It is a fact, however, that even within Honours groups, more or less serious degrees of unproficiency are prevalent below the top level; while from the Honours grade downwards the work of language students, not to mention that of pupils at school, can show grave inequalities of standard. Creditable achievements occur at all stages. But it is undeniable that language work can sink through gradations of dubious competence to depths of incompetence involving hundreds of young people annually in aimless and fruitless dissipation of energies which could have been directed to more useful objectives, free from the deterrent of having to acquire a medium.

Object of Language Study

After thirty years' experience in most kinds of examining, thinking exclusively for the moment of the state of the language (with acknowledgements of progress made in many quarters), I confess to having often felt puzzled to know what is really the object of the large-scale study of French in this country. Or to start with a more rudimentary form of question: Why are so many children taught foreign languages? In putting the matter in this blunt way, I am as anxious not to single out the schools for disproportionate blame as I am eager to admit the rapid advance that can be made by beginners, if well taught—a rate of progress often times deceptive, if judged by later achievements.

To discover an answer to the foregoing question, I have opened books like the *Memorandum on the Teaching of Modern Languages*, issued by the Incorporated Association of Assistant Masters in Secondary Schools,[1] and turning to the first chapter on the Aims of Language Teaching, I have relapsed into vagueness and doubt. Take this curiously worded passage: "What will he (the Modern Language teacher) seek to give his pupils, beyond helping in their general development, that only the study of a modern language can give?—It is not easy to give a clear and definite answer. The Committee found in the course of its work that most terms used generally, and by its own members, in defining aims were understood in several varying senses. . . " It is typical, I fear, of the indefinite nature of educational operations that the question, why learn a modern language? dissolves into an admission of the terminological confusions that arise in attempting to frame the question itself.

[1] University of London Press, 1929.

From books I turned to persons and interrogated among others a former high official of the Board of Education, who, although not a modern language expert, was admirably conversant with French and interested in the fortunes of that language in this country. He would hear nothing of treating language learning as a means of training the faculties and insisted that a language should be taught for use.

What does " Proficiency " Mean ?

What degree of proficiency is implied in teaching a language for use ? In other words, what do we mean by " proficiency " ? This word, like most of those used in contemporary education, does not stand for a stable or objective standard or even for a clear and distinct idea. It is obvious that there are academic standards of *relative* proficiency which differ very considerably from that absolute which Dr. H. E. Palmer appears to have had in mind when he defined the object of language teaching as to enable the foreign pupil to speak like a native, read like a native, and write like a native. Here Dr. Palmer is doubtless thinking of ideals to be kept in view. He would probably agree with most of us that in practice there are many different grades of proficiency appropriate to different stages of the pupil-student's career. What I am concerned to ask is, how much language does a pupil or student know when he has finished his course ? Or more precisely, how nearly do academic standards correspond to useful degrees of real proficiency ?

Let us attempt to visualize this situation ? Who has not at the close of a session's various examining, especially if it has included much school work, had the sensation of landing from a choppy sea, an ocean of tossing results, crossed by a few high waves arriving at odd intervals to lift his bark from the slough of despond ? Who has not realised as he shakes off the brine, that great numbers of those who are left in the slough will remain there for ever, for what hopes of rescue have they from institutional language teaching ? And who has not asked, what does it all amount to for the foundered? The recent Harvard report on *General Education in a Free Society* frankly admits that low-grade language instruction is justifiable only as *ancillary* to the learning of the mother-tongue. Well, after nearly a century of French and German teaching, what had the Norwood Report to say about the state of English ?

At the university level there can never have been a time when so many undergraduates as at present had so insecure a grasp of the

languages they had begun to learn four or five years earlier at school. Grammar has become nebulous—or is it that too many "grammars" are being taught at once? As for phonetics they flourish in some quarters and seem to have become extinct in others. Let me repeat: the plight of hundreds of undergraduates is not due solely to insufficient preparation at school. However well they do their work, the schools can hardly be expected to transform the majority of their numerous pupils into so many good linguists. A large part of the difficulty lies in the disproportion between the language-teaching resources of university departments and the size of their classes, which can dwarf the largest class the schools justly complain of. The departments, however talented their staff, however brilliant their record, are not equipped, nor does it appear likely they will ever be equipped, to engage in the task of bringing the majority of their students to a high level of practical competence in the all-round command of foreign tongues. Such an objective would require more teachers, tutors, coaches and crammers, and far more time devoted to the language in its modern form, than any department could possibly afford, having regard to the intellectual content of the subject and of other subjects in which the undergraduate may be interested. The contrast between our leisurely modes of language teaching, modelled largely on Latin, and the methods adopted by Army Language Schools would doubtless be instructive. But for the university to exchange one model for another would be to risk turning the departments into commercial language schools; and that of course no one wants.

A Question of Numbers

If, adding to the numbers of students of French those in other popular language departments, one pauses to realise what proportion of a Faculty of Arts are "doing languages," the spectacle of frustration takes on dimensions any cool estimate of which might seem an exaggeration to the common reader. I will content myself with a couple of questions, one general, one specific. First, in the general economy of the national education, having in mind the schemes of study, curricula and equipment now in vogue, has not saturation point in the recruitment for languages already been reached? Or, more simply, is not the educational system of this country carrying more language-learners than it can effectively provide for on present resources—resources which on the mechanical

side may often seem fantastically inadequate? How many foreign language departments, apart from the few that can draw upon a practical phonetics section, are not still running on blackboard-and-chalk lines in a world of television, super-cinemas and split atoms? What I really want to get at is this: Judged from the standpoint of values, educational, cultural and practical, have languages (apart always from the mother tongue) a right to preferential treatment? Given limited block grants in perpetuity, should further expansions in languages, for instance, take preference over Social Studies?[1]

Resources at the University Level

My second question is, what can be done now to husband resources at the university level? Neither question can be dealt with adequately here. But I will attempt to answer the latter in so far as it applies to one aspect of the *modus operandi*, namely to the condition of students in their first year or at the junior grades.

Much error and waste in Arts practice has been due to the false assumption that the " Intermediate " or first-year stage in languages invariably corresponds to a useful degree of proficiency. This has led to the imposition of single-year end-stopped courses (usually in Latin and/or modern languages) of a grade too low to yield satisfactory results in all but a small percentage of cases. Such compulsions, it must be admitted, are now being modified or abandoned in certain quarters. Yet in most Arts schemes the regulations still constrain, canalize or inveigle students, proficient or otherwise, into taking courses of this kind either as a count towards the total of degree requirements or as ancillary to other courses. The latter might be thought the more serious claim. Ancillary accomplishments are no doubt desirable. But provision for them should be made outside the scheme of studies for the degree. It is an odd recommendation of a university course to call it a " tool," as the Americans do, to distinguish this secondary type of utility. Moreover, courses which prescribe the acquisition of media for one year only are obviously not the most useful for expanding the students' range of knowledge.[2] The more proficient, as everyone

[1] I am not assuming that the present *disproportion* of learners as between one foreign language and another is satisfactory. Nor do I demur at the necessity of providing for certain languages not hitherto taught in this country.

[2] It will of course be claimed that all language Intermediate courses carry some useful "content." True; but why not reduce the less profitable side to a minimum, show a sign of reckless ingenuity: abolish the " prose " exercise, teach reading alone, and let the students concerned learn more about France and Germany in their own language. They might pick up many things which Honours students have to go abroad for.

knows, kick their heels ; as for the others, the pseudo-" Intermediate " becomes a demi-semi-final, leading nowhere beyond itself.

This is how the contrivance works. Out of some hundreds of examination scripts, nearly a half may fail to procure the pass-mark of 50 per cent. The resultant holocaust will look like a responsible act on the part of the executioners. But what of the victims themselves, who have lost a year struggling with a subject which most of them may never have wanted to take ? Cases of such magnitude are by no means rare. But it is the proportion of the " lost " I want to draw attention to. The mischief is common in many forms. Suppose, as often happens, a minimum of 25 per cent. of Final Pass candidates fail, and that another 25 per cent. pass at between 50 per cent. and 55 per cent. of the marks. Such pass-marks give no guarantee of reliable proficiency on the language side even at the university stage.

This game of rebuilding Babel annually at the expense of hundreds of undergraduates absorbs much of the energy of scores of assistant lecturers, employed in correcting exercises in which gross incompetence only too often triumphs over pathetic efforts to improve—" To the greater Glory of God," as a student of mine persistently wrote above her lamentable exercises ! What earthly progress could she hope to make in eight months as member of a large class meeting a remote, if conscientious, teacher a few times a week ? " Babel " indeed is a euphuism for a situation in which a good half of our language students find little or no chance to " talk " in departments which have difficulty enough in providing oral opportunities for the upper ten. For to rid our centres of illumination of such ephemeridae as are directed towards the gleams they can never overtake would but clear the air. We should still be faced with the responsibility of maintaining such standards in the use of the modern tongue as the better students have brought up from their schools—a sufficiently onerous responsibility as yet by no means fully discharged to every student's satisfaction.

A Recommendation

Recently one of our wisest minds was reported to have referred to " the tendency to assume that everyone should be educated rather than that the highest standard of education for the few should be maintained."[1] With the reservation that a nation of forty-eight

[1]Attributed to T. S. Eliot by a reviewer in the *New Statesman and Nation*, 21st June, 1947.

millions could be expected to produce 100,000 young people worthy of some kind of university education, I perceive a sense in which the quotation applies to my present argument. It would probably be agreed that the highest justification for teaching a foreign language is that its acquisition provides a key to another national culture and facilitates the comprehension of other modes of life, including the appreciation of alien political attitudes. However desirable it might seem that the majority of one nation should be able to communicate with the majority of another, such an ideal is still so far from practicable that, unless some way is found of teaching and learning languages more quickly and more securely, we may soon see the establishment of artificial media for many urgent, non-cultural purposes. For what is being obscured today by all this "language-learning business," with its proliferation of certificates gained at low pressure, is the irrefutable fact that to acquire a foreign tongue thoroughly is a strenuous and difficult job for all but specially gifted or advantaged adepts. Academic methods may be sound and sure; they are undeniably slow to produce results and slower to revise their own technique. I have not been advocating a drastic reduction of the total of language learners. But I should like to suggest: (i) that there be a more equitable and useful balance of learners as between the prominent world languages; (ii) that it might be advisable to concentrate teaching resources upon those pupils and students who show aptitude, while the others are diverted to more suitable studies or employments; (iii) that no language department admit students for less than two consecutive years; (iv) that each language-teaching nucleus be strengthened in its establishment and equipped with every appropriate device for promoting all round competence in the majority of its members; (v) that the presentation of language subjects, the relative value of contents and the practical effectiveness of exercises be seriously reconsidered in the light not only of recent discussions but of the observations and implications contained in the Government report on *Modern Studies* of 1926; (vi) that more numerous facilities be provided to enable teachers and learners to sojourn abroad at frequent intervals; and (vii) that lending libraries of foreign books be founded at centres convenient for distribution to teachers outside the few great towns that provide such resources.

AN UNDERGRADUATE'S VIEW OF THE UNIVERSITY

By R. O. Bolt

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A student writing about the universities from the student's point of view can claim no authority for what he writes other than as it represents his own experience. It is the reader who has to assess its relevance to other times and places. If, therefore, a personal note is sounded in much of what follows, it should be taken as a gesture of humility, rather than the opposite. Most of all, it is hoped that no impression will be made of attempted judgment. What follows is a subjective account.

The Undergraduate comes up

The purpose of the school boy in coming up to the university is a convenient fiction. It is generally, so far as he is concerned, a matter of momentum. Purpose is the prerogative of teachers, parents, and friends. All the same it is possible to speak of what, with varying degrees of intensity, the undergraduate *expects*. He expects, of course, to leave the university with a higher earning capacity than he has on leaving school, but this is a mainly parental preoccupation. He expects to acquire technical skill in the handling of his subject: but this is the principal expectation of comparatively few. Most of all, he expects excitement—the excitement of swiftly widening horizons, stimulating friendship, and of contact, flattering and enviable, with those who, if any, may be expected to *know*. The excitement with which an undergraduate for the first time takes up residence is the most valuable asset he has, either from his own or from his university's point of view.

His expectations are met; but with an emphasis almost the reverse of his own.

The Undergraduate is examined

The emphasis which the university places upon the wage-earning aspect of his studies is unspoken, and no doubt unintentional. Indeed any such emphasis is explicitly denied, and where found in the student himself, deplored. Nevertheless, in the system of detailed and all-embracing examination, it exists. Whether it was the demand of the world in general, and employers in particular, for an

unambiguous sign by which the man of ideas could be identified, which led the universities to evolve this system of defences penetrable only by holders of the right passwords; or whether the universities themselves gave rise to the demand by creating a supply, is beside the point. The effect on undergraduate life is unmistakeable.

The newcomer has adopted the prevalent wary stance in time for his first terminal. He comes to appreciate the specialised skill with which the quality of six months' work is tested in four forty minutes questions, and makes suitable preparations. The study of past question papers, with due attention to the rhythmic cycle observable therein, is only the most obvious of these. More important, he apprehends from the atmosphere of his department, which sections of the syllabus are important, and which aspects of these are interesting. It is by thus concentrating on interesting aspects of important sections that he prepares for the final encounter.

On the minority, whose main expectations are technical, this system does not bear heavily. The acquisition of an advanced technique of study, such as will be useful in extreme specialisation and research, is in no way opposed to successful examination preparation. Though even the student whose enthusiasm is thus sharply canalised will find it difficult to communicate except through the medium of the general preoccupation.

But what of the majority whose most serious and vivid expectancy was that of excitement?

The Undergraduate asks

Where this expectation is passive it dies for lack of sustenance. Where it is active enough to forage for itself, it tends to develop into something more serious yet, to take the form of a more specific questioning. The question that is asked is nothing less than: "How shall I select from the infinity of circumstances which will surround me when I leave this university, which to engage myself in, and which to ignore?" (This can be restated objectively making mention of "values," but that is not how it appears, subjectively, to the student looking to the termination of his university life). Unless the student is one of those who can frame this question in terms of an academic technique, his enquiry receives negligible attention.

The undergraduate comes up with this question incipient in his mind. It has been a main purpose of his previous training, if he has been lucky, to suggest that it is an important one. On going down,

however, he feels not that he has just completed the longest chain of institutionalised education available, but as if he had mistakenly served an apprenticeship in a trade he had not intended to practise. It would be interesting to know, of the people who leave universities after taking a B.A., what proportion of those who do not actually teach continue in the study of their subject. Still more difficult to discover, and more interesting to know, would be the proportion amongst those who do teach, who take up the profession because it provides the only kind of environment they feel equipped to enter. " It seems the only thing to do " is a phrase with which the walls of Arts Faculty buildings must be impregnated.

Unless the universities are prepared to accept as narrowly technical a function on the Arts as they seem almost already to have done on the Science side, this question will have to be given its true status. At the moment one feels that its asking is regarded merely as a comparatively innocuous manifestation of youthful high spirits.

Does the undergraduate then demand a similarly defined pattern, which he can take with him from the university? Is he asking his professor for a world-view, a formulated answer to his question which he can learn by heart? No, he is not. There are several formulated answers to hand, and the membership of the Unions' Catholic, Communist and intermediate groups is small. In the words of Martin Buber, " Only times which know a figure of general validity—the Christian, the Gentleman, the Citizen—know an answer to that question, not necessarily in words, but by pointing with the finger to the figure which rises clear in the air, out-topping all."

What the student is asking for is not an answer to his question, but help in the asking of it. He expects, that is to say, that more experienced, better furnished, and presumably more powerful intellects than his own, will indicate which ways of asking it are fruitful, and which not.

" But," the lecturer protests, " I am not a prophet or professional wise man. I am a geologist." (Or a historian, or a philologist, or whatever he is). The undergraduate does understand this, even though his understanding may appear as an infrequent and refreshing phenomenon. He is not, to repeat, asking for a code of commandments. But the intention of the university is not only to extend the limits of what is known, but also to educate numbers of people, supposedly chosen as being suitable for the purpose. And the juxta-

position of these two purposes is not accidental. Nor is the one a mere by-product of the other. It is understood that the university does not purport to think up an answer to any problem which society may happen to have on its mind. But it is also understood that the university—geologists, historians, philologists, and the rest—is in a special sense the recipient of the traditional wisdom of that society. The extension of the bounds of knowledge is what keeps the tradition alive. Nothing could be more important. But the expectation of the student to be offered close contact with this tradition, both as a stimulus and a support, is a legitimate one.

The Undergraduate is answered

The living tradition must be presented in a living way. In fact, it is usually presented mechanically and piecemeal, and a test is applied which does not penalise, if it does not actually favour, a mechanical and piecemeal reception by the student. The examination is rightly a stiff one. It would only make matters worse to try to cope with its abuses by lowering its standard. However, one's instructors are usually sympathetic. Lectures are delivered and subjects set with one eye of the calendar where June is marked with a black cross. The student is honestly appreciative; it is not necessary to make his attendance at lectures compulsory. But he must take his question elsewhere, or put it in abeyance while he settles down to the business of getting his degree. Or else he concludes that the examination itself, or rather his showing in it, is the answer he is looking for. It is here that the damage is done, and particularly so if he goes to schoolmastering, for in this case the people whom he subsequently sends up to the university will have a preconditioned tendency to adopt the same view.

Only if the life of the living tradition has been communicated to them, that is, only if they have themselves felt its pulse and seen its movement, can they feel that the degree represents a contact which is vital to them, and which must be strengthened and not allowed to lapse.

It is surely clear that when the university cannot "point to a figure of general validity," cannot offer a code, then the need for personal contact between students and staff becomes urgent. Precisely because it is not possible to lay down principles in black and white, the subtle intermediate shades become all important. We can always hear Professor X discussing the formation of the Pen-

nines; we may even hear, if we have an active Students' Union, what he thinks of the ethics of atomic warfare. What we rarely, very rarely, see, is Professor X arriving at these conclusions. We never see him actually using the traditional wisdom of which he has so obvious a command. We never know how it is done. It seems unusual, in the course of three years of provincial university life, to have more than a few hours of genuinely personal contact with one's instructors.

And if it is said that the student tends increasingly to come up with a background of general culture insufficient to such contact, let it be remembered that he acquired most of it from various institutions whose staffs are university trained. The educational system is a closed circle, and only the universities are so placed as to be able to initiate a break through.

The Undergraduate goes down

The split between the thinking of the lecturer and the lecture he delivers, is the same split which divides the thinking of the undergraduate into two sections, one concerning his life, the other concerning his degree. It also tends to divide the undergraduate body into corresponding sections, with disastrous effects upon its communal life. It results finally in the congregation of large numbers of B.A.s at the extremes of the graduate spectrum. At the one end is the pedogogue, with his false confidence and subconcious unease. At the other is the " realist," who regards the introduction of " pure knowledge " into the solution of " concrete problems " as pedantic and frivolous.

There is a suggestion of completion about graduation; society could hardly afford to extend a general education beyond the early twenties. The undergraduate when he first comes up may expect, if he is very young, to go down a completed man. Normally he abandons the idea, if he ever had it, quite quickly. But while he may not expect completion in the sense of " having all the answers," he is right to expect that he should, so to speak, graduate as a questioner. In point of fact, to the extent that he persists in asking his questions, he frequently does so without the aid of a discipline in which he can place an honest trust. And often he goes down, not preparing to deepen the scope of his own enquiry, but to teach —as he has been taught.

UNIVERSITY DEPARTMENTS OF EDUCATION

By I. L. Kandel

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The establishment of Institutes or Schools of Education, following one of the recommendations of the report of the McNair Committee on the Training of Teachers and Youth Leaders provides an opportunity for a consideration of the place of departments of education in universities and of education as a subject of university study. Departments of education, it must be admitted, have on the whole not enjoyed great esteem in academic circles. This may in the past have been due to the fact that such departments, when first introduced, were primarily concerned with the training of teachers for elementary schools with which the academic specialist was not directly concerned. Such training was thought to be limited to instruction in methods of teaching with little concern for content. When such departments undertook the training of teachers for secondary schools, the academic specialist was inclined to be sceptical about the innovation, because he believed that mastery of subject matter was an adequate preparation and that training in how to teach was an unnecessary addition, which could in any case be learned by experience.

While there may have been some grounds for such attitudes to departments of education in the past, when elementary and secondary education constituted separate and distinct parts of the national system—the one for the masses and the other for a select minority and requiring only a relatively small body of teachers, the situation has completely changed. The national system is being reorganised with elementary and secondary education forming an articulated and unitary whole, and with an increasing number of students passing from the secondary schools to the universities and other post-secondary institutions.

But more important perhaps than the reorganisation of the educational system is the change in the character and variety of education itself, and the demands placed upon the teaching profession. Teaching in the past was a relatively simple matter. The responsibility of the teacher was in the main to transmit a certain

amount of knowledge, which the pupils were required to master through drill, repetition, and memorisation. The acquisition of knowledge was enforced by rigid discipline, which disregarded individual differences of ability. The method of testing mastery of knowledge was by examinations, both internal and external. Under such conditions the training of teachers was limited to instruction in methods of teaching, since the aim and content of education were specific and clearly, if narrowly, defined.

The aim of education has, however, been broadened. It must still be concerned with intellectual training, but it is realised that intellectual training is dependent upon a large number of factors—particularly physical and emotional—which were ignored in the past. Nor can drill and memorisation alone be relied upon as the methods for intellectual training ; pupils learn best that in which they are interested, in the sense that they understand the meaning and relevance of what they are expected to learn. They should be able to appreciate the practical utility of what they study, which Cardinal Newman defined as " not useful in any low, mechanical sense, but as diffusing good, or as a blessing, or a gift, or power, or a treasure, first to the owner, then through him to the world."

Such a concept of education and instruction places a greater responsibility upon the teacher than when the primary aim was to transmit knowledge—any kind of knowledge—on the assumption that the effort to master it trained the mind for all contingencies of life. This responsibility does not mean that the teacher should be any less a master of the subject that he professes to teach. It means that the teacher must have a greater awareness of the relation of what he teaches both to the abilities of his pupils, and to the environment in, and for which they are being educated. He must accordingly be concerned with the two data of education—the pupil and the environment—if he is to serve as an intelligent intermediary between the two.

Education and National Culture

To understand the environment as the medium in which and for which the pupil is to be educated at once broadens the whole approach to education as a serious national concern. In a lecture on *The Study of Comparative Education*, delivered at the beginning of this century, Sir Michael Sadler stressed the importance of such understanding when he said that " A national system of education

is a living thing, the outcome of forgotten struggles and difficulties and ' of battles long ago.' It has in it some of the secret workings of national life. It reflects, while seeking to remedy, the failings of national character. By instinct it often lays special emphasis on those parts of training which the national character particularly needs."

From this point of view the study of education is far more than the study of methods of teaching, which it is too often interpreted to be. The study of school organisation, curricula, and methods of instruction must be considered in the light of those national forces, of the national culture that give them meaning and life. This approach to education is implied in the statement in the White Paper on *Educational Reconstruction* (1943) that the plans for the reform of education were intended " to provide means for all of developing the various talents with which they are endowed and so enriching the inheritance of the country whose citizens they are " and to " open the way to a more closely knit society and give us strength to face the tasks ahead."

The study of education, approached in these terms, restores the pattern established by Plato in *The Republic.* Plato showed that education cannot be discussed in a vacuum and that its character is determined by theories of psychology, politics, ethics, culture, social organisation, and economics. In the study of education in the past too many of these theories were either ignored or taken for granted. Even the formation of character, or, as Aristotle said, making citizens " good and able to do fine actions," or education for the good life has become a frequently repeated but unexamined cliché. The same may be said of education for citizenship as an aim, which is too often advocated without direct discussion of the political ideal which it is to serve. The history of education has in the main been devoted to a study of theories and practices in isolation instead of being, what it should be—a study of the relation between education and cultural backgrounds, in the fullest sense of the term, concerned with the history of culture and politics and their impact on education. Nothing is more needed in the study of education than a realisation that it is a social process. Without this realisation, too much attention may be devoted to the mechanics, the methods, and the technique of teaching subjects *qua* subjects and without relevance to life—those aspects to which Comenius referred as *puerilia illa toties nauseata* when he had a vision of the larger part that education might play in the destinies of mankind.

It is with the larger and more fundamental aims as they are determined by the broad social, political, and cultural demands and needs of society that the study of education must first concern itself. It is primarily in the light of such aims that the problems of education can be fruitfully investigated. Particularly is there needed in English education a quality which Sir Fred Clarke has referred to as *articulateness* instead of reliance on intuitive methods or "hunches." For, as he says in *The Study of Education in England* (1943), "if we conducted our medical and engineering services and our industrial production with the same slipshod carelessness, the same disregard for precision of thought and language, the same wild and reckless play of sentimentality, or class prejudice or material interest masquerading as principle, with which we carry on our public discussions about education, most patients would die, most bridges would fall down, and most manufacturing concerns would go bankrupt."

The Foundations of Education

At no period is that articulateness about the aims and purposes of national education so urgently needed as at a time of crisis and transition, when there must be a re-examination of the cultural heritage to be transmitted and of the directions in which it is to be strengthened and enriched. Traditional patterns of education, which may have served the needs of the few, must be reviewed and, if necessary, be reshaped when opportunities for education are to be brought within the reach of all in accordance with their abilities. Hence the first task in the study of education must be to discover the contributions that it can make to national welfare and national progress. Every teacher must in a sense be a specialist, but he must be aware of a common frame of reference to which the special work in which he may be engaged must be related. That frame of reference he can acquire through the study of the history and philosophy of education, of comparative education, the study of which "will result in our being better fitted to study and understand our own" (system of education), and of educational sociology—the latest subject to be added as a contribution to understanding the social milieu which also has an important part to play in determining the aims, the methods, the content, and the organisation of education. The study of the four branches of education mentioned should promote an understanding, in its broadest sense, of the cultural environment which is the first of the two data of education.

The second of the two data is what Sir John Adams called the "educand," the pupil to be educated. One of the serious defects of educational practices in the past was the tendency to uniformity, and to disregard differences of ability and its causes. The change which is taking place is indicated in the statements, first, that education is concerned not only with intellectual training but with training the whole man, and, second, that there has been a shift of emphasis from the subject to the child. Both statements imply that in order to teach a child, it is necessary to understand everything about him. Hence the educator must draw upon biology and physiology, if he is to understand the meaning of heredity and of growth, and the relation between health and school progress. Since the child both before entering school and during his school days is exposed to a large number of forces that affect his development, those influences —the family, the neighbourhood, the cultural background in general—must be taken into account. The school has become more than an agency for transmitting knowledge and for intellectual training; it is expected to assume responsibility for the physical and emotional development of the child; its task is no longer supplementary to the work of the home and other educative influences outside the school, but many of the functions which are being neglected by these agencies are being transferred to the school. Here, then, is a further reason for including in the study of education some initiation into an understanding of the social and cultural backgrounds from which pupils are drawn. Since the school is only one of the agencies that influence the development of the child, it is essential that the others, which either supplement or compete with its work, should be taken into consideration. This does not mean that the teacher is to become a clinical case worker or a mental hygienist, but that he must be aware of the possible causes of difficulties on the part of his pupils and refer them, when necessary, to the appropriate authorities, just as he would refer pupils in poor physical condition to the medical officer. And in the case of all pupils the teacher should have a heightened sense of responsibility for the development of standards of moral conduct, and judgment and taste in view of the competing influences outside the school.

The Scientific Basis of Education

The most striking change that has taken place in the present century has been in the theories of classroom management and

methods of teaching. In this change the chief contribution has come from modern psychology. The statement that there has been a shift of emphasis from the subject to the child can only be interpreted correctly, if it is interpreted to mean that the teacher, if his instruction is to be successful, must know each pupil as an individual. The teacher must in fact become a diagnostician and learn all he can about the abilities, the interests, and the backgrounds of his pupils. Accordingly, one of the fundamental subjects in the study of education is the psychology of education. It is from this subject that the inter-relations between the physical, emotional, and intellectual have been learned. As a result of research, more accurate information is now available about growth, the learning process, the meaning of interest, and individual differences of ability. In so far as education is becoming a science, it is due to the application of scientific methods, and of the techniques of statistical measurement to problems of education. While the study of this field demands special ability and training, all teachers should at least have some familiarity with its aims and purposes, since its use will in all probability be extended as a method of research. But even in educational research there is some danger that it may be forgotten that the use of statistical measurement is only an instrument supplementary to a general theory of the aims of education.

In so far as education can become a science, it will in the main be through the contributions of psychological research. Teaching is an art, but an art that can be improved by these contributions. One of the serious difficulties that confronts departments of education is to provide adequate opportunities for the practice of teaching. Few departments have control of schools of their own, a situation which is as illogical as would be schools of medicine without hospitals. While there is some advantage in placing students in the ordinary schools where they can familiarise themselves with conditions that they will later have to meet, for purposes of demonstration, experimentation, and research schools under the immediate control of departments of education are greatly needed.

Up to this point the discussion has dealt with the content of the study of education, which is desirable in order to promote a certain professional unity of understanding. It would be well if the academic specialists concerned with the status and preservation of their particular subjects would co-operate with departments of education

in the training of subject specialists; both sides would gain from such co-operation.

Members of established faculties of universities do not, as a rule, look with favour upon the creation of new departments or faculties. In the past departments or faculties of education have always suffered from this attitude. And yet it is important that university departments, institutes, or schools of education should co-operate with the local authorities in their area, and, it is equally important that an even closer co-operation should be promoted between the faculties of a university and its department of education. For the faculties of arts and sciences, in particular, should be more intimately related by community of interests with departments of education than with any other professional faculty or department. Without sympathetic understanding and co-operation there is always the danger of a cleavage which may result in an emphasis by departments of education on the professional subjects—on methods of instruction and other professional studies divorced from content, on "how to teach" rather than on "what to teach." University teachers cannot participate in setting and marking examinations for secondary school certificates or for university entrance, nor can they undertake to write textbooks for school use or serve on governing boards of schools, and yet disavow all interest in the work of a department which provides the professional preparation of those teachers, the results of whose efforts they profess to assess.

The description of what is involved in the study of education may raise the question of the amount of time that can be given to it. There is no doubt that the one year now devoted to it in universities is all too short. Closer co-operation between departments of education and other university departments may in time make it possible to initiate prospective teachers into the study of education earlier than is the practice to-day. That time could be found, if it were only realised that very few prospective teachers require the preparation of potential researchers. Certainly such fields as the history of education, the philosophy of education, comparative education, and sociology could be incorporated in requirements for degrees.

Education Departments as Centres of Research

Beyond the initial preparation of prospective teachers, institutes or schools of education in universities, have a broader function to

perform as centres for educational research. There is already an increased demand on the part of teachers for opportunities for post-graduate studies. The problems of administration, organisation, classification and allocation of pupils, educational and vocational guidance, measurement of pupils' progress, revision of curricula and methods of instruction are accumulating and are pressing for investigation. The whole question of the place of examinations and other methods of assessing the achievement of pupils, may also be attacked as soon as the prevalent bias in favour of traditional practices is overcome. There may even be internal problems within a university—selection of entrants and the study of student records as the basis for improving selection, for example—which may be referred to the departments of education.

It has always been one of the weaknesses of the organisation of English education that local education authorities and university departments of education have not co-operated more closely. Such co-operation would be bi-polar. The departments of education could use the schools in their localities both as laboratories and as centres for research problems and could provide advanced training for the teachers and officials in service. The local education authorities could co-operate with the departments on problems of research and on experiments in education. There is still another function that departments of education could perform. As educational systems increase in size there is always present the danger that administration may become bureacratic. There is no better way of countering such a tendency to emphasise the processes and forms of administration rather than the ends which it is to promote, than through the existence of agencies of criticism; departments of education may well serve as such agencies by providing opportunities for the discussion of problems of education in courses organised for teachers in the schools of their locality.

The place of university departments of education was clearly defined by Dr. James E. Russell in 1900 soon after he was appointed dean of Teachers College, Columbia University, when he said that " University departments of education have as their special function the investigation of educational foundations, the interpretation of educational ideals, and the application of educational principles. The science of education . . . needs to be developed and made over to fit modern conditions."

REVIEWS

ETHICS FOR UNBELIEVERS. *By* AMBER BLANCO WHITE. (*Routledge & Kegan Paul*, 12*s.* 6*d.*)

This is an extremely useful and timely book. We all know very many young people who are perplexed about the basis of morals, and inclined to doubt whether any secure basis is possible without religious dogma. While this doubt persists, they are faced with the alternative of either regarding morality as questionable or, on pragmatic grounds, accepting beliefs which they see no good ground to think true. It is to those who suffer from perplexities of this kind that Mrs. Blanco White's book is addressed. Her arguments are based, broadly speaking, on common sense together with the guidance to be obtained from psycho-analysis. There are difficult philosophical questions as to the basis of ethics and the nature of ethical propositions; these, no doubt wisely, are not discussed. There is a broad agreement among mankind about a number of matters, such as that it is better to be well fed than starving, healthy than ill, and so on. Almost all men condemn murder of other members of one's own community. Most people condemn cruelty within one's own herd, provided it is recognised as cruelty. (Here custom sets limits to humane feeling, for instance in the former Chinese practice of binding women's feet.) Broadly speaking, Mrs. Blanco White takes such ethical judgments for granted, except when there is some definite reason for rejecting them.

There are, it is true, problems which are perhaps more difficult than they appear in her treatment. Take, for instance, health. She says, and we shall agree, that health is desirable, and that this includes mental as well as physical health. But she admits that what is considered mental health varies in different communities. Nevertheless, she holds that there is an objective standard of mental health. Head-hunters, she maintains, are not mentally healthy, even when they only conform to the practice of their tribe. I think that here her own ethical preferences have slipped in, and that she refuses to regard as healthy people who have certain psychological characteristics that she considers harmful. I should add that we should almost all of us agree with her judgments as to what is harmful.

The book deals admirably and very persuasively with the traditional view that moral codes depend upon revelation. The author points out that some things which such codes have enjoined are "formidable impediments to good behaviour," and that, as a matter of fact, the ages of faith were not more moral than our own more sceptical period:

> "Anyone who thinks that the sceptical young people of today are peculiarly immoral, should study the laws passed in mediæval Europe to deal with the conduct of apprentices, and contemporary denunciations of their idleness, drunkenness, unchastity and riotous behaviour."

I am glad to see this point of view put emphatically. There is a great deal of nonsense talked about the beneficial moral effect of dogmatic religion, without any attempt to check rash assertions by the evidence of history.

There are two excellent chapters on the origin and nature of conscience, and

in connection with communal codes there is a forcible exposition of the evils resulting from bigotry during the dark ages and the middle ages.

Two chapters on The Good Man and The Good Society rightly put the Good Man first: communities, it is argued, cannot be judged good or bad apart from the individuals who compose them, although a large part (not the whole) of what makes a good individual consists in his being a good citizen.

I could wish that the last chapter, on sexual morality, had been somewhat fuller, if only because it is on this subject, especially, that many who have abandoned orthodoxy feel perplexity and a dread of a tendency to undue laxity. I have no fault to find with what is said, but only with the fact that so many problems are ignored.

The book is eminently readable. Its discursions are lively and topical, and likely to be very profitable to the kind of reader for whom they are designed. I hope that it will be widely read.

BERTRAND RUSSELL.

HUMAN KNOWLEDGE: ITS SCOPE AND LIMITS. *By* BERTRAND RUSSELL. (*Allen & Unwin*, 18*s. net*).

The central topic of this widely-ranging book is the bearing upon the methods of modern science of the logical problem of induction. Philosophers (but perhaps only philosophers) have been worried by this problem since Hume showed that the inferences we all make (in daily life as well as in science), from the observation of " frequent or constant conjunctions of objects " to conclusions concerning "objects beyond those we have experienced "are radically different in kind from those we make in mathematical or other deductive arguments where inference has a formal logical guarantee. Hume concluded that non-deductive inferences such as the belief based on experience that flames will be hot and snow cold are not rational, but are the operation of a species of natural instinct and insisted that attempts to justify inductive inference by resting it on some general principle such as that " the future resembles the past " were hopeless because no such principles could be established without recourse to the inductive inference they were supposed to support.

In Bertrand Russell's view Hume's doubts about the rationality of induction overshadow the elaborate methods of modern science as much as the simpler inferences of common sense. But many would object that though philosophers who have discussed the " validity " of induction have helped to clarify the once obscure difference between inductive and deductive reasoning, the existence of this difference creates no *problem* save for those who insist on restricting the honorific titles of " rational," " valid," or " knowledge," to the procedures of deductive inference and indiscriminately stigmatize all other inference from the mere hunch to the most thoroughly tested scientific prediction as " instinct." Philosophers, it is said, thus first raise a dust and then claim that scientists (and common men) do not see. In a sense Bertrand Russell recognises that the problem is a terminological one, for though he says often that scientific methods " require for their validity " certain principles which he finally enunciates in the form of five postulates and alarmingly adds that experience cannot render these postulates

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"even probable" yet he castigates those who would refuse the title of "knowledge" to the propensity of scientists to make and estimate predictions as if these postulates were true. He even says that if this is not knowledge " we know nothing whatever." Accordingly the precise sense in which the validation of scientific method is a problem other than one of nomenclature remains obscure; and the principal value of Bertrand Russell's discussion of the " problem " is that it helps to *characterise* but not to criticise or justify the ways in which scientists construct and appraise their theories.

Besides many brilliant discussions of difficult scientific concepts, this book provides a new exposition of Bertrand Russell's epistemology and of his views on language, often distinguished by a wonderful lucidity and grace. Yet it is odd after reading in the preface that the book is intended for the general reader and " that philosophy loses much of its value if only a few professionals can understand it " to find the summation sign, and also the integration sign used without explanation. Bertrand Russell might wield his old weapon—Occam's razor—for the benefit of a new edition, for not all the difficult passages in symbols seem necessary for the argument, even where it is concerned with a hydra-headed notion of probability.

H. L. A. HART.

THE FACTORIAL ANALYSIS OF HUMAN ABILITY. *By* GODFREY H. THOMSON (3rd Edition). (*University of London Press, pp.* 392, *price* 21*s.*).

Thomson's *Factorial Analysis of Human Ability* has now become established as an indispensable textbook for students of psychology and education engaged in factorial research. The fact that a third edition of the book has been called for so soon is an encouraging indication that the workers in this field are increasing in numbers. Not only so, the methods of factorial analysis are now finding their way into other fields like social science and economics. In recent years there has been much give and take in the use of statistical techniques. Fisher's *Analysis of Variance* which was first developed in agricultural research has been applied with significant results to psychology and education. And now, in turn, the factorial methods which have been applied with such success in psychology and education are being modified and adapted for even wider use. This is as it should be.

The third edition of Thomson's *Factorial Analysis* does not differ significantly from the second, but it places the researcher in the author's debt by bringing the subject up to date. In the first edition Thomson included a section which he called " Stop Press." This edition is his latest " Stop Press " edition and for it we are grateful. The new sections are, as we would expect, rather technical. There are three new sections on the identity of oblique factors after univariate selection, on multivariate selection, simple structure, and on parallel proportional profiles. Of necessity these sections have had to be made short, with the result that a somewhat greater strain is put upon the reader than he experiences when reading the main body of the book. But, as the new sections are intended for the serious researcher rather than for the novice who seeks to know what factorial analysis is all about, the extra strain will not come amiss. At the

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same time one wonders whether the latest discussions add to our understanding of " patterns " and " structures " to such an extent that the application of the new refinements is truly worth while. In the final analysis the mathematical results must be psychologically interpreted. Many a young researcher has found that a close examination of the simple centroid pattern has led him to psychological understanding which more elaborate mathematical analysis has sometimes tended to deny him.

All who are engaged in psychological and educational research will welcome this up-to-date edition of a very admirable book.

H. R. HAMLEY.

THE POETRY OF SIR THOMAS WYATT. *By* E. M. W. TILLYARD. (*Chatto and Windus*, 8*s.* 6*d.*).

Dr. Tillyard first published this " selection and study " of Wyatt's poetry in 1929; addressing it to the general reader " who may easily tire of the business of picking out poetry from experiment." The selection consists of sixty poems in a modernised text based on the best manuscripts, and on the critical editions of Nott (1816) and Foxwell (1913). The introduction has a biographical sketch, a section on Wyatt's sources, a study of the selected poems, and a short note on the history of the text.

The " general reader " is still compelled to read Wyatt's most famous poems in the *Oxford Book of English Verse* and other anthologies in the seriously garbled form in which Tottell published them in 1557. To show that this is not a point of pedantry compare a stanza as printed in the Oxford Book from Tottell, with Dr. Tillyard's version from the author's holograph, Egerton MS. 2711 in the British Museum:

Tottell

Thanked be fortune, it hath been otherwise
Twenty times better; but once especial—
In thin array: after a pleasant guise,
When her loose gown did from her shoulders fall
And she me caught in her arms long and small,
And therewithal so sweetly did me kiss,
And softly said, " *Dear heart, how like you this?* "

Tillyard

Thankt be fortune, it hath been otherwise
Twenty times better; but once especial,
In thin array, after a pleasant guise,
When her loose gown from her shoulders did fall,
And she me caught in her arms long and small,
Therewith all sweetly did me kiss,
And softly said: " Dear heart, how like you this? "

As Tillyard says in his note: " much of the poem's charm and force lies in the expressive irregularity of rhythm which Tottell amends away." But is " irregu-

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larity" the right word for such musical subtleties as those of the fourth and fifth lines of this stanza?

Dr. Tillyard has chosen to reprint his book, after twenty years, in its original form, giving as his reason that "not enough new material has appeared in the interval to demand recasting." This decision is the more to be regretted because the quality of Dr. Tillyard's discriminating praise leaves us tantalised with questions.

If Tillyard is right in saying that Wyatt "made a number of important corrections" in a poem (p. 171) ought he not to discuss them? We have scarcely any holograph MS. of important poems before Milton; the Egerton MS. of Wyatt is not only in his own hand, but in chronological order with revisions; does not this offer material for a serious study of his technique? Unfortunately, Tillyard thinks little of Wyatt's sonnets, and repeats the text-book gibe that he wrote them "as a schoolboy hammers out elegiacs" (p. 26). Yet he admits that "the credit of evolving the Shakespearean form is almost entirely due to Wyatt" (p. 27). How did Wyatt come to desert the Italian and invent the Shakespearean form, which radically alters the sonnet structure; and why did it prevail in England until Milton's time? Ought not Dr. Tillyard to have looked again to see if he could include a few more of Wyatt's poems: "Thou restful place, reviver of my smart," perhaps; and certainly: "Patience! for I have wrong."

Above all, any discussion of Wyatt must include a discussion of his most cryptic sonnet:

"Whoso list to hunt? I know where is an hind. . ."

and it is a serious omission that Tillyard neither prints nor mentions it. The passage of time makes it more and more clear that a full-length study of Wyatt is still required.

ORMEROD GREENWOOD.

VOLUNTARY ACTION. *By* LORD BEVERIDGE. (*George Allen & Unwin Ltd.*, 16s.)

All Beveridge's books are informative, educational, and very readable. This latest is no exception, but, whereas his Report on Social Insurance in mid-war (1942), was a kind of moral bombshell, which had repercussions all over the world and helped the Democracies to win the war, this volume has fallen comparatively flat.

But only "comparatively," because it is a storehouse of information about an important side of human activity, which will, for many thousands of our liberal-minded fellow citizens, be regarded as the text-book on *methods of future social advance* in British countries.

Yet it will not stir the Western World, if only because it deals, not so much with state action, which is all the rage in these days, as with the voluntary efforts of ordinary people in the fields of Mutual Aid, Social Service and Philanthropy. In other words it sets out the past, present and future of all those social movements in Britain, without which the modern all-purpose State could never have

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achieved the impressive new line-up of official and compulsory Social Security schemes, which in 1949, we still find a little staggering and hard to get used to.

Thus, " Voluntary Action " is a very timely and useful survey both of the good and of the less good features of voluntary social service in Britain. It was commissioned a year or two ago, not by the Government, but by the National Deposit Friendly Society. Further aid came subsequently from the Nuffield Foundation.

Beveridge started with his usual careful researches into the facts. For this he obtained the aid of a group of expert assessors—many the same as helped in his Report on Social Insurance. And the factual studies alone in this book are well worth the money charged for it. There had not, it seems, been any real review of the work of Friendly Societies since the Report of a Royal Commission in 1871–74.

The author brought the chequered history of the Prudential, the Oddfellows, etc. up to date, and has looked into their future on their behalf. Having lost his battle to retain the Friendly Societies in the actual management of National Insurance, he sees that Friendly Societies can still serve the public interest (and their own), by offering supplementary insurance cover over and above the national minimum of 26*s*.

As regards British charities, Beveridge approves the Nuffield Trust, Pilgrim Trust, and some others which show no sign of going out of date, but he shows that changes are urgently needed in a much larger group of older Trusts and Charities. He proposes more powers for our existing Charity Commissioners, or even the establishment of a new body to make radical changes in the use of funds which are in danger of being wasted.

The words " Voluntary Social Services " today denote the care of the young or the aged or the material or moral rehabilitation of distressed folk. The impact of State Social Security schemes upon voluntary societies performing these functions is, of course, mentioned in this book, but the subject does not take such a prominent place as some readers hoped and expected. Obviously these valuable, kindly humane services must go on; many of them, indeed, expect expansion in the future. Every succeeding generation throws up men and women to whom voluntary work in these causes is a social duty and a source of happiness. In the view of the writer, voluntary bodies are to be regarded as indispensable ancillaries to the State Insurance, Family Allowances, and other official security services. And they are doing work which could never be done half as well by civil servants, either of the central or local government types; their independence of state control and their unofficial manners are the soul and secret of their success. Nor will the stream of good-will offerings ever dry up entirely. To give one's money away to good causes is an endemic disease in Britain, which neither the Chancellor of Exchequer nor Mr. Bevan will ever cure.

RONALD DAVISON.

PERSONNEL SELECTION IN THE BRITISH FORCES

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THE HEBREW UNIVERSITY OF JERUSALEM. (*Annual Report*. 1947-8, *Jerusalem, English Edition*.)

The Hebrew University of Jerusalem has recently published a fresh edition of the Yearbook, which gives a full account of its work and its plans of development up to the time the British Mandatory Administration of Palestine came to an end. The book appeared at a dramatic moment in the history of the University, of which the first Institute was opened 25 years ago. Actually the printing press at which the manuscript had been completely set was destroyed by bombing, and it was with the greatest difficulty that the book was produced in Jerusalem during the struggle.

The Yearbook sets out in detail the programme and courses of the different departments of the University. Jewish and Oriental Studies have pride of place, but all the subjects, general as well as Jewish, Chemistry as well as Bible, are taught through the medium of Hebrew. There are two full faculties; (1) of the Humanities; and (2) of the Sciences and Mathematics; a School of Agriculture, a Department of Education for training teachers, and a Post-graduate School and Research Institute of Medicine. Regular medical courses for undergraduates are being opened this year. The University Library, which is also the National Library, contains half-a-million books and is far the largest in the Near and Middle East. The principle of learning for learning's sake is steadfastly upheld. The University is open to all students whatever their race or creed. It is, however, primarily intended for Jewish students of all parts of the world. For many of them it is their only hope of securing higher education. But it was notable that in 1947 over a hundred undergraduates came from the United States, most of them young men who had been in the American forces during the war, to take the benefit of the G.I. Bill of Rights in Jerusalem.

In the bitter fighting last year in and around Jerusalem the University suffered very grievous losses. Seventeen members of the staff, academic and administrative, including three of the professors and some of the heads of the Medical School, were killed in an attack on a convoy going to the University Hospital and the University buildings on Mount Scopus. Over a hundred students have fallen in battle and a larger number were wounded—a heavy proportion of the young men. And all the buildings on Mount Scopus were shelled by Arab forces during the bombardment in May and June, and suffered severely. The teaching work of the University was interrupted last year, when nearly all the students were mobilised for military service. Access to the University, which is two miles from the town and is within the Arab lines, was cut off; and the University has acquired temporarily for both its teaching and its research work the College of Terra Santa in the Jewish section of new Jerusalem. Meantime the buildings on Mount Scopus have been placed under guardianship of the United Nations.

Large plans have been worked out to fit the University for its new functions in the State of Israel. It will have to train the lawyers, the doctors, the scientists and the civil servants of the State. The Faculty of Law is to be opened in the next academic year, and a Department of Social and Economic Sciences is being greatly enlarged. President Weizmann is the Chairman of the Board of Governors; and Sir Leon Simon, formerly Director of National Savings in England, is the Chairman of the Executive Council of the University in Jerusalem.

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BIRMINGHAM UNIVERSITY. VICE-CHANCELLOR'S AND PRINCIPAL'S REPORT FOR THE CALENDAR YEAR 1948.

The annual reports of Vice-Chancellors are more than ever valuable to-day and the recent one from Birmingham delightfully produced shows that numbers have doubled and now stand at 3,300. This the Vice-Chancellor considers to be a reasonable limit. Lack of buildings is the critical difficulty. A labour-force of 100–150 men is a miserable start to a £10 million development programme. As far as student problems are concerned the Vice-Chancellor emphasises financial difficulties. At a time when so many students are drawing ex-service grants it is something of a surprise that the unsubsidised student should already be such a problem. The Report of the Working Party is not mentioned, presumably because it came too late, but experience at Birmingham underlines the urgency of replacing the F.E.T. grants quickly.

On the academic side the university is carrying out some highly interesting experiments to broaden the undergraduate's education and to combat specialisation. In particular some detail has been eliminated from the honours course for electrical engineering students : in its place have been substituted lectures and discussions in philosophy, literature, economics and the impact of the natural sciences on society. Each student is expected to write a substantial essay each session on some subject outside his professional syllabus. Efforts are also being made to improve the general education of arts students by lectures cutting across departmental frontiers. ELIZABETH LAYTON.

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